Teslin Lake Bird Observatory Final Report 2016

Yukon
BIRD OBSERVATORIES

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Society of Yukon Bird Observatories
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The 2016 operation of the Teslin Lake Bird Observatory was made possible due to support and financial contributions from the following organizations.

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Cover Photo: A Rufous Hummingbird captured at the observatory on July 29, 2016 was the second record of the species at the site (Photo: Jukka Jantunen).

The Teslin Lake Bird Observatory is operated by the **Society of Yukon Bird Observatories** (SOYBO; PO Box 30056, Whitehorse, YT, Y1A 5M2). SOYBO was established in 2010 to serve as an umbrella society to coordinate bird monitoring activities and associated educational programs at the Yukon Bird Observatories field stations. The objectives of SOYBO are: (1) contribute to the conservation of migratory birds in western North America, (2) to help people learn about the natural history and conservation of Yukon avifauna, and, (3) to work with other societies, organizations and individuals with similar objectives. For further information, visit the SOYBO website at www.yukonbirdobservatories.org

SUMMARY

During 2015, the Yukon Bird Observatories (Teslin Lake and Albert Creek) were granted full membership status to the Canadian Migration Monitoring Network (CMMN). The Yukon Bird Observatories are the northernmost and the only stations located within the core of Canada's Boreal Forest.

The Teslin Lake Bird Observatory completed its ninth consecutive year of fall migration monitoring in 2016. The field station operated for a total of 82 days between July 25 and October 15. The observatory has followed the same operating procedures since standardized migration monitoring began during the fall of 2009.

Crews followed standard methods to mist net, handle, band and record information from captured birds. They banded a total of 2,780 birds of 51 species with 7,981 net hours (34.83 birds/100 net hours). Alder Flycatcher, Yellow Warbler, Orange-crowned Warbler, Myrtle Warbler and Slate-colored Junco were the five most common species banded, accounting for over 65% of all individuals banded. These have been among the top species banded in previous years although the banding total of 498 Alder Flycatchers was the lowest date as compared to the 2008-2015 average of 686 and the record high of 1,058 during 2015.

Visual migration and lake counts were conducted to collect monitoring data for bird species not adequately sampled by mist netting (for example diurnal raptors, loons and grebes). Between July 26 and October 15, personnel spent 187.25 hours and observed 38,056 (203 birds per hour). These included 1,946 individuals of 12 diurnal raptor species, of which two are regional species of interest for monitoring - Swainson's Hawk and American Kestrel. The remaining visual migrants included a number of species with the most common species being Tundra Swan, unidentified passerines, American Robin/Varied Thrush, White-winged Crossbill/unidentified crossbills and Common Redpoll/Pine Siskin; collectively, these species accounted for 73% of all visual migrants observed.

Building upon testing of methods in previous years, audio equipment was used to broadcast recorded calls to lure and band Boreal Owls in the standard count area. On 8 nights between August 24 and October 1, 2 Boreal Owls were banded with 113.25 net hours of effort.

Noteworthy results from 2016 included:

- The number of birds banded was slightly below the long term and the capture rate of birds per 100 net hours (34.8) was also below the long term average (45.4) but higher than the long-term low of 28.7.
- Numerous species were banded in relatively high numbers with Orange-crowned Warbler, Ruby-crowned Kinglet and White-winged Crossbill being the most notable.
- A single new species banded at the observatory (Least Sandpiper) and six new species were observed including: blue morph Snow Goose, Great Blue Heron, Iceland Gull, Sharp-tailed Sandpiper, Red Phalarope and Northern Rough-winged Swallow.
- To date a total of 31,962 birds of 93 species have been banded at the observatory and 201 species have been observed.

- The visual counting effort was consistent with the amount of effort in previous years and the total number of birds observed (204 birds/hour) was well above average and slightly below the highest of (218) during 2011 and 2015.
- A total of 1,946 raptors and 14,885 waterfowl were observed on the visual migration counts with the most common species being Harlan's Red-tailed Hawk and Tundra Swan respectively.
- The lake counts tallied a total of 182 bird days of shorebirds (14 species), 686 bird-days of loons (3 species), 1,061 bird-days of grebes (2 species) and 3,090 bird-days of gulls/terns/jaegers (9 species).
- A total of 23 volunteers spent a total of 866 hours at the observatory and a total of 74 individuals visited the observatory totaling 203 visitor hours.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

1.0 Introduction

This report describes methods and results of work done at the Teslin Lake Bird Observatory from July 25 to October 15 in 2016, the ninth year of fall operation at this site. No new activities were undertaken at the observatory in 2016.

Previous annual reports and the database of band recoveries can be found on the Society of Yukon Bird Observatories website: www.yukonbirdobservatories.org

1.1 Background

The observatory collects information on birds which is shared through an international bird banding database (Canadian Wildlife Service Bird Banding Office and USGS Bird Banding Laboratory), Society of Yukon Bird Observatories annual station reports, and other publications. During 2014, the Yukon Bird Observatories (Teslin Lake and Albert Creek) were granted full membership status to the Canadian Migration Monitoring Network (CMMN). The CMMN is a nationwide network of 26 member stations from across Canada that collect standardized bird monitoring data and collaborate on research projects. The Yukon Bird Observatories are the northernmost stations and are located within the core of Canada's western Boreal Forest.

Many of the birds banded and observed at Teslin Lake are highly migratory, spending the winter months as far south as Central and South America. In addition to the knowledge gained from band recoveries, the observatory also continues to gather baseline data of birds (and their migration) in the Teslin region and the Yukon as a whole. Due to the large landmass of the territory, and the relatively few bird biologists and advanced birders in the Yukon, there is still a great deal to be learned regarding the bird life of the Yukon. The observatory serves as a highly valuable research and monitoring project to better understand the distribution of the Yukon's bird species, some of which are considered uncommon or rare. Over the long term, the data collected at the observatory will facilitate trend analysis for a number of species. Such information will be valuable for conservation and monitoring of bird populations not only in the Yukon, but North America as a whole. In addition to monitoring bird populations, the observatory collects a substantial amount of data on each bird banded. Information such as age, sex, measurements (wing, tail, etc.) and molt timing continue to add to the knowledge base of such information across North America.

The observatory plays a role in education as a place where the public, volunteers and students can take part in a unique, community based research and monitoring project. Numerous people visit the observatory on an annual basis and the field station has become a valuable training opportunity for individuals interested in learning about ornithological research and monitoring methods.

1.2 Goals of the Teslin Lake Bird Observatory

The goals of the Teslin Lake Bird Observatory are to:

- Gather baseline information on birds and bird migration in the Teslin area.
- Collect data to facilitate the long term monitoring (*i.e.* trend analysis) of birds in the southern Yukon.
- Conduct and participate in specific studies such as feather collecting for stable isotope analysis and color banding.
- Provide a setting for the public including school groups to learn about birds and bird migration.
- Provide employment and training opportunities for students and volunteers.
- Provide a unique tourist attraction for the community of Teslin.

1.3 Objectives of the 2016 Season

The objectives of the 2016 field season at the Teslin Lake Bird Observatory were to:

- Continue the fall monitoring work using previously established protocols,
- Collect an additional year of bird monitoring data to be used for future trend analysis,
- Further refine the techniques to capture and band owls,
- Collect information on the molt timing of adult passerines banded, and,
- Compare 2016 bird migration results to the previous 8 years of similarly collected data.

1.5 Acknowledgements

The 2016 operation of the Teslin Lake Bird Observatory would not have been possible without financial assistance from the following organizations/groups: Environment and Climate Change Canada (Canadian Wildlife Service), Yukon Fish & Wildlife Enhancement Trust Fund, Teslin Renewable Resources Council, Yukon Health and Social Services (Youth Investment Fund) and EDI Environmental Dynamics Inc. Yukon Parks provided use of a space in the Teslin Lake campground for an extended period of time to allow our long term volunteers a place to camp for the duration of the 2016 season. Jukka Jantunen's excellent bird identification skills ensured high quality data collection, particularly during the visual migration counts which are challenging to complete with a high level of accuracy and consistency. Jukka has been the Bander in Charge at TLBO since full scale fall operation of the observatory began during 2008. James Hawkings provided editorial comments on the draft version of this report.

We appreciate the help from the following volunteers without whom the operation of the observatory would not have been possible:

- more than 50 days – Sonja Panozzo;
- 10 to 20 days – Ted Murphy-Kelly, Julie Bauer and Josan Moss;
- 1 to 5 days – Janna van Kessel, Brad Kaeding, Rox-Ann Duchesne, Andera Sidler, Brandon Semesock, Masumi Horiguchi, Shyloh van Delft, Brenna Kelly, Gwen Baluss, Cameron Eckert, Terry Skjonsberg, Lila Tauzer, Carrie Boles, Anne MacLeod, Ben Schonewille, Tracy Allard, Julie McCrum, Martin McCrum and Boris Dobroswky.

2.0 Methods

2.1 Study Site

Teslin Lake is a 125 km long by 2-5 km wide lake in the south central Yukon near the border with British Columbia. The standard count area is located near the outlet of 10 Mile Creek at the site known locally as Ten-mile Point; this area is located on the east shore within the north third of the lake. The lake falls in a natural trench that runs to the northwest and serves as a migration route for many bird species coming from breeding areas to the north in Yukon and Alaska. The site falls within the Yukon Southern Lakes Ecoregion (Boreal Cordillera Ecozone)[1].

During the 2005 season, the observatory was located on the shoreline of Nisutlin Bay; however, issues associated with land tenure of the site led to a new site being used since 2006. The current site is located on 10 Mile point approximately 10 km northwest of the community of Teslin. The observatory is located in the riparian zone between Teslin Lake and the Yukon Government Campground (Figure 1). The vegetation within the site is a mixture featuring a transition from bare gravel lakeshore to shrubs and larger deciduous trees. Also within the site is a small wetland area connected to Teslin Lake which has seasonally fluctuating water levels. The area is dominated by willow (*Salix* spp.) and alder (*Alnus* spp.) with some mature white spruce (*Picea glauca*), trembling aspen (*Populus tremuloides*) and balsam poplar (*P. balsamifera*) scattered throughout.

2.2 General Methods

The methods for the operation of the bird observatory follow the Teslin Lake Bird Observatory Field Protocol and Manual[2]. A brief summary of the field protocol is described in the following sections; however, for a detailed description refer to the publications page of the Society of Yukon Bird Observatories website (www.yukonbirdobservatories.org).

All monitoring activities at the observatory can be separated into standardized and non-standardized methods. To facilitate long term analysis of the observatory's data, the standardized data is collected in the same format year after year. Non-standardized activities may include species specific mist nets within the count area or the collection of banding/observation data outside of the standard count period.

[1] Smith, C.A.S., Meikle, J.C., and Roots, C.F. (editors), 2004. Ecoregions of the Yukon Territory: Biophysical properties of Yukon landscapes. Agriculture and Agri-Food Canada, PARC Technical Bulletin No. 04-01, Summerland, British Columbia, 313 p.

[2] Schonewille, B. 2011. Teslin Lake Bird Observatory (TLBO) Field Protocol (version 2). Society of Yukon Bird Observatories.

Figure 1. Overview of the Teslin Lake Bird Observatory (60.2319 °N, -132.9159 ° W). The numbers and red lines are mist nets, each 12 m long with the exception of net 28 which is 18 m in length. There is a campground bordering the mist netting area on the south side (right hand side of the photo. The red line with the "C" is the non-standard canopy net.

For every species observed, estimated totals are calculated for each day of operation using the following categories:

- Band: new birds banded.
- Recaptures: previously banded birds, not included if recaptured on the original day of banding.
- Visual Migrants
    - Migration Watch: birds observed in obvious migration flight, only includes individuals observed during the visual migration counts.
    - Incidental: birds observed in obvious migration flight, only includes individuals observed incidentally (i.e., not during the visual migration counts).
- Observed: birds observed, but not in obvious migration flight; includes incidental observations and the lake counts.

Using the categories outlined above, the Bander-In-Charge estimates the total number of individuals observed within/passing through the count area within the standard count period on a daily basis. Using only the standard count period data, this number represents the Daily Estimated Total (DET) and when the non-standard data is included, this number represents the Daily Species Total (DST). The DET data will provide the basis for future trend analysis of the data collected at the observatory.

During 2016, the operation of the Teslin Lake Bird Observatory was led by the Primary Bander in Charge Jukka Jantunen. Jukka was responsible for overseeing all activities at the observatory including the capture/banding of birds, supervising volunteers, conducting the visual migration watches, recording the daily estimated total data and entering the data. Ted Murphy-Kelly was Co-Station Manager which included station logistics, staffing and filling in for the primary bander. Ben Schonewille was also a Co-Station Manager, and looked after data analysis and the preparation of this report. Board members of the Society of Yukon Bird Observatories helped administer the Yukon Bird Observatories.

Site infrastructure is minimal at this site. A narrow trail connects the banding table to the nets and to the station access point via the Yukon Government campground. There is no covered blind from which to watch birds and nets are removed at the end of the season and are stored away from the site. The site is partially within the high water mark of Teslin Lake and on land owned by the Yukon Government as a component of the campground reserve. To date this level of activity has not required any permitting aside from the federal and territorial permits required for the capture and banding of birds, and a permit from Yukon Parks allowing extended use of a campground site.

2.3 Mist Netting

The primary method of monitoring the movement of birds through the study site is the use of mist nets for the purpose of capturing and banding birds. The observatory operates with 22 standard mist nets and one non-standard mist net (Figure 1). No non-standard nets were used in 2016; note that in previous years a trial canopy net (net ID = C on Figure 1) was used. All nets are 30 mm mesh, 4 panels tall, and 12 m in length, with the exception of net 28 which is 18 m in length. The standard mist netting effort begins at official sunrise and continues for 6 hours. The full mist netting effort is achieved only on days when adequate personnel are present onsite and weather conditions are favourable. If full effort is not possible, then the number of nets operated is reduced rather than reducing the duration of effort.

2.4 Visual Migration Watch

Visual migration counts are conducted on all days of operation to supplement the banding data. All watches are conducted from the observation site (Figure 1) and involve scanning the sky with binoculars and a spotting scope to observe and count all birds flying past the site. The protocol states that as a minimum, 10 minutes of watch shall be conducted per hour (6 hours) followed by a 1 hour watch at the end of the mist netting period. On many days of operation the visual count effort is substantially more. The visual migration counts aim to monitor diurnal migrating species such as raptors and large waterfowl. Most nocturnal migrants such as most warblers, sparrows and thrush are well monitored by mist netting. However, for some species which are not adequately covered by mist netting, the visual counts allow for monitoring data to be collected for these species.

Whenever possible, additional information on age, sex and/or color morph is collected for the birds observed during the visual migration watches. Particularly for raptors, the information can supplement the data collected by providing information on the proportion of younger birds.

2.5 Lake Counts

Completed in conjunction with the visual migration counts, a thorough lake count is performed daily from the observation site with a spotting scope to enumerate all birds on or over Teslin Lake which are visible from the predetermined viewing location. These counts target a wide range of species including; loons, grebes, some waterfowl, gulls and some species of shorebirds.

2.6 Incidental Observations

Incidental observations are collected on a continuous basis at the observatory. For example, birds observed while conducting mist net checks would be considered incidental observations. Birds in obvious directed migration, e.g. flying overhead in flocks or raptors passing overhead, were recorded as 'incidental migrants'.

2.7 Molt Scoring

As supplementary information, in order to assess the timing of molt, we rate the growth of new flight feathers in adult birds that are banded. Although information on the prebasic molt (amount of juvenile plumage remaining) is collected for hatch year birds, a particular emphasis was placed upon collecting wing molt scores for molting adult individuals because this would tell us about the timing of the molt as it relates to the timing of migration in various species of adult birds.

Wing molt score is achieved by assigning each individual wing flight feather a score from zero (old feather remaining) to five (new feather fully grown) and adding them together. Birds that have not yet started to molt have a cumulative score of zero whereas individuals which have completed molt would have a score of 75 (based on 9 primary flight feathers) or 80 (10 primary flight feathers).

2.8 Special Projects

2.8.1 Owl Banding

Based on owl capture methods used in southern Canada to capture Northern Saw-whet Owls that we had tested in previous years on Boreal Owls, we decided to do more dedicated trials using these methods to build upon the success of this program during 2014 and 2015. This method uses nocturnal call playback in the vicinity of a mist net array.

During 2016, we broadcasted only Boreal Owl calls using an IPod connected to a portable speaker system with an internal battery. We broadcast within the standard count area at the bird observatory. On most nights, five 12 m nets were used in the standard count area. At this site the owl calls were broadcast constantly for between 2.0 and 5.25 hours beginning at dusk on the following days: August 24, September 2, 5, 7, 8, 10 and 30, and October 1.

2.9 Public Engagement

To attract members of the public to the observatory, we put up posters at various common buildings in Teslin including the Nisutlin Trading Post, the Yukon Motel, the Teslin Tlingit Council Administration Office and the Post Office. We also advertised the observation through digital media including the Yukon Bird Observatories blog, Facebook page and website. Interested individuals could also find articles in the Yukon News in May and September, on the Yukon Government Wildlife viewing program calendars and media advertising.

3.0 Results & Discussion

3.1 Station Operation

The 2016 fall season included a total of 77 field days between July 25 and October 15. Standardized mist netting occurred on 63 days between July 25 and October 2; opportunistic banding occurred on three days (August 20 and September 22/30). After October 2, activities at the observatory were limited to visual migration counts, lake counts and incidental observations.

A total of 2,780 birds of 51 species were banded (excluding special projects) and 139 species were observed (Table 1, Table 2). The all-time total number of birds banded at Teslin Lake Bird Observatory is now 31,962 birds of 93 species and 201 species/forms have been observed (Appendix A). New species added to the station checklist during 2016 included: a blue morph Snow Goose, Great Blue Heron, Iceland Gull, Sharp-tailed Sandpiper, Red Phalarope and Northern Rough-winged Swallow. Least Sandpiper was the only new species banded during 2016.

Table 1. Summary statistics for the 2016 fall season.

Week	Date	Days Operated [1]	Birds Banded				Visual Counts		Total Species Observed
			#	Species	Net Hours	#/100 Net Hours	# of Visual Migrants[2]	Counting Hours	
1	25 – 31 Jul	7	252	29	769.50	32.75	721	4.49	64
2	1 – 7 Aug	7	234	31	939.50	24.91	337	4.49	71
3	8 – 14 Aug	7	192	24	918.00	20.91	186	1.49	54
4	15 – 21 Aug	6	460	27	809.25	56.84	542	8.83	68
5	22 – 28 Aug	6	241	26	797.00	30.24	768	7.51	65
6	29 Aug – 4 Sep	7	872	24	810.00	107.65	6400	18.16	75
7	5 – 11 Sep	7	276	26	736.50	37.47	6817	29.49	79
8	12 – 18 Sep	7	144	20	853.75	16.87	2705	19.83	71
9	19 – 25 Sep	6	48	13	764.50	6.28	2957	22.83	60
10	26 Sep – 2 Oct	7	61	12	580.00	10.52	3934	22.66	65
11	3 – 9 Oct	6	-	-	-	-	8229	29.16	64
12	10 – 16 Oct	4	-	-	-	-	5671	18.30	37
ALL	25 Jul – 16 Oct	77	2,780	51	7978.00	34.85	39267	187.24	139

[1] Requires a minimum of 3 hours onsite with full estimated totals recorded (does not require mist netting if weather conditions are adverse).

[2] Note this total includes visual migrants counted during the visual counts and incidental visual migrants observed.

Table 2. Birds banded during the 2016 fall season (not including special projects).

Common Name	Scientific Name	# Banded	# Banded / 1000 Net Hrs
Sharp-shinned Hawk	*Accipiter striatus*	10	1.30
Merlin	*Falco columbarius*	1	0.13
Spotted Sandpiper	*Actitis macularius*	1	0.13
Least Sandpiper	*Calidris minutilla*	1	0.13
Wilson's Snipe	*Gallinago delicate*	1	0.13
Belted Kingfisher	*Ceryle alcyon*	4	0.50
Downy Woodpecker	*Picoides pubescens*	4	0.50
Northern Flicker	*Colaptes auratus*	3	0.38
Olive-sided Flycatcher	*Contopus cooperi*	1	0.13
Western Wood-Pewee	*Contopus sordidulus*	3	0.38
Yellow-bellied Flycatcher	*Empidonax flaviventris*	16	2.01
Alder Flycatcher	*Empidonax alnorum*	498	62.42
Least Flycatcher	*Empidonax minimus*	7	0.88
Hammond's Flycatcher	*Empidonax hammondii*	19	2.38
Western Flycatcher	*Empidonax difficilis / occidentalis*	1	0.13
Say's Phoebe	*Sayornis saya*	2	0.25
Northern Shrike	*Lanius excubitor*	1	0.13
Warbling Vireo	*Vireo gilvus*	24	3.01
Black-capped Chickadee	*Poecile atricapillus*	24	3.01
Boreal Chickadee	*Poecile hudsonicus*	40	5.01
Red-breasted Nuthatch	*Sitta Canadensis*	3	0.38
Golden-crowned Kinglet	*Regulus satrapa*	3	0.38
Ruby-crowned Kinglet	*Regulus calendula*	89	11.16
Townsend's Solitaire	*Myadestes townsendi*	2	0.25
Gray-cheeked Thrush	*Catharus minimus*	8	1.00
Swainson's Thrush	*Catharus ustulatus*	82	10.28
Hermit Thrush	*Catharus guttatus*	7	0.88
American Robin	*Turdus migratorius*	3	0.38
American Pipit	*Anthus rubescens*	2	0.25
Northern Waterthrush	*Parkesia noveboracensis*	34	4.26
Tennessee Warbler	*Oreothlypis peregrina*	13	1.63
Orange-crowned Warbler	*Oreothlypis celata*	364	45.63
Common Yellowthroat	*Geothlypis trichas*	57	7.14
American Redstart	*Setophaga ruticilla*	15	1.88
Yellow Warbler	*Setophaga petechial*	449	56.28
Blackpoll Warbler	*Setophaga striata*	134	16.80
Myrtle Warbler	*Setophaga coronate*	286	35.85
Townsend's Warbler	*Setophaga townsendi*	2	0.25
Wilson's Warbler	*Cardellina pusilla*	172	21.56
American Tree Sparrow	*Spizella arborea*	20	2.51
Chipping Sparrow	*Spizella passerine*	31	3.89
Savannah Sparrow	*Passerculus sandwichensis*	17	2.13
Fox Sparrow	*Passerella iliaca*	10	1.25
Song Sparrow	*Melospiza melodia*	1	0.13
Lincoln's Sparrow	*Melospiza lincolnii*	13	1.63
White-crowned Sparrow	*Zonotrichia leucophrys*	15	1.88
Slate-colored Junco	*Junco hyemalis*	229	28.70
Rusty Blackbird	*Euphagus carolinus*	6	0.75
White-winged Crossbill	*Loxia lecoptera*	46	5.77
Common Redpoll	*Acanthis flammea*	3	0.38
Pine Siskin	*Spinus pinus*	3	0.38
TOTAL		2,780	348.46

Weather conditions largely influence the activities at the observatory. Windy conditions and periods of prolonged precipitation reduce the mist netting effort. Weather conditions also influence the number of birds counted on the visual migration counts due to challenges associated with visibility and the dynamic nature of bird migration in relation to wind patterns. The 2016 season saw temperatures that were slightly warmer than previous years and the amount of wind was slightly less than previous years (Table 3, Table 4). The number of days with precipitation (17) was below average of 25 days.

Table 3. Summary of weather conditions during the 2016 fall season.

Weather Parameter	Week							
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Average Opening Temperature (°C)	11.6	9.3	11.1	8.9	7.0	7.4	4.2	5.5
Average Closing Temperature (°C)	15.6	20.0	18.3	15.6	18.0	10.7	12.1	12.3
Average Opening Wind (Beaufort scale)	2.3	1.0	1.9	1.1	1.3	1.9	1.1	1.5
Average Closing Wind (Beaufort scale)	2.9	2.0	2.4	1.6	2.0	2.7	2.4	2.8
Days with Rain (during count period)	2	1	1	2	2	2	2	0
Days with Snow (during count period)	0	0	0	0	0	0	0	0

Weather Parameter	Week				TOTAL
	9	**10**	**11**	**12**	
Average Opening Temperature (°C)	1.7	-1.7	-1.7	-5.5	**4.8**
Average Closing Temperature (°C)	11.6	6.1	4.0	1.0	**12.1**
Average Opening Wind (Beaufort scale)	1.7	1.7	1.3	2.0	**1.6**
Average Closing Wind (Beaufort scale)	3.3	2.6	1.7	1.8	**2.4**
Days with Rain (during count period)	1	2	0	0	**16**
Days with Snow (during count period)	0	0	1	0	**1**

Table 4. Comparison of weather conditions during 2016 as compared to previous years.

Weather Parameter	Annual Average							2010-2015 Average
	2010	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	
Average Opening Temperature (°C)	4.4	3.5	2.6	6.0	4.7	4.4	4.8	4.3
Average Closing Temperature (°C)	13.0	10.4	10.7	14.4	11.8	10.2	12.1	11.8
Average Opening Wind (Beaufort scale)	2.3	1.7	1.7	1.5	1.4	1.3	1.6	1.7
Average Closing Wind (Beaufort scale)	2.8	2.6	2.9	2.7	2.3	2.5	2.4	2.6
Days with Rain (during count period)	20	33	17	14	32	19	16	22
Days with Snow (during count period)	3	4	6	0	5	2	1	3

3.2 Patterns in Captures

Each component of the 2016 data is summarized and presented in the following subsections; however, a summary account of the 2016 estimated total data is shown in Appendix B. Unless otherwise stated, the results presented in this report combine and summarize both standard and non-standardized data. Note that the estimated totals are derived on a daily basis by the Bander in Charge and incorporates all

data collection components (mist netting captures and all observations) to estimate the number of birds of each species within or passing through the count area.

Among the top 15 species banded during 2016, 8 were captured in above average numbers and 7 below average. (Table 5). Among the species banded in above average numbers, Orange-crowned Warbler was banded in the most notable numbers with a season banding total of 364 compared to the long term average of 196 and the previous high of 331 in 2015. The most notable species banded in below average numbers was Alder Flycatcher of which 498 were banded in 2016 as compared to the 2009-2016 average of 693 and the previous low of 506 in 2014.

Table 5. The 15 most common bird species banded in 2016 as compared to 2009–2015 totals (numbers in brackets indicate the annual ranking in birds banded). The prefix "T" indicates a tied in annual banding totals.

Species	2016	2015	2014	2013	2012	2011	2010	2009	2009-2016 Average
Alder Flycatcher	498 (1)	1,058 (1)	506 (1)	770 (1)	827 (1)	637 (1)	620 (2)	631 (2)	693
Yellow Warbler	449 (2)	556 (2)	504 (2)	333 (3)	225 (2)	310 (3)	471 (3)	325 (4)	396
Orange-crowned Warbler	364 (3)	331 (4)	149 (6)	124 (6)	88 (8)	57 (14)	271 (5)	180 (6)	196
Myrtle Warbler	286 (4)	311 (5)	178 (4)	163 (4)	195 (3)	142 (5)	673 (1)	284 (5)	279
Slate-colored Junco	229 (5)	211 (7)	140 (7)	341 (2)	116 (7)	331 (2)	420 (4)	582 (3)	296
Wilson's Warbler	172 (6)	386 (3)	164 (5)	122 (7)	134 (T5)	133 (6)	177 (7)	161 (8)	181
Blackpoll Warbler	134 (7)	99 (10)	61 (10)	87 (8)	87 (9)	58 (13)	194 (6)	107 (10)	103
Ruby-crowned Kinglet	89 (8)	284 (6)	69 (9)	125 (5)	134 (T5)	86 (8)	109 (8)	175 (7)	133
Swainson's Thrush	82 (9)	68 (12)	49 (11)	55 (10)	41 (14)	85 (9)	53 (13)	49 (13)	60
Common Yellowthroat	57 (10)	89 (11)	82 (8)	65 (9)	45 (13)	72 (12)	70 (11)	113 (9)	74
White-winged Crossbill	46 (11)	0 (-)	2 (T37)	5 (T31)	2 (T38)	1 (T49)	100 (9)	2 (T41)	20
Boreal Chickadee	40 (12)	131 (9)	3 (T31)	23 (16)	142 (4)	233 (4)	0 (-)	831 (1)	175
Northern Waterthrush	34 (13)	53 (15)	48 (12)	46 (12)	47 (11)	42 (15)	54 (12)	53 (12)	47
Chipping Sparrow	31 (14)	29 (17)	15 (19)	20 (16)	17 (18)	28 (18)	18 (22)	24 (20)	23
Warbling Vireo	24 (15)	24 (10)	12 (22)	48 (11)	15 (20)	17 (T22)	19 (21)	10 (T27)	21

Among the top 10 species banded in 2015, the majority of birds banded across all species were hatch year individuals (Table 6) which is consistent with previous years. Numerous species show a considerable amount of year to year variability in hatch year proportions. For example, only 41% of Alder Flycatchers banded were hatch year as compared to the long term average of 75% and the previous low of 72%. For such species banded in relatively high numbers, the proportion of hatch year birds may be able to be used to provide perspective on regional productivity.

Table 6. Age ratios (% hatch year) for the top 10 species banded during the fall of 2016.

Species	2016	2015	2014	2013	2012	2011	2010	2009	2009-2016 Average
Alder Flycatcher	41	73	85	84	81	72	90	75	75
Yellow Warbler	44	48	48	68	61	71	73	72	60
Orange-crowned Warbler	81	62	82	81	84	79	90	81	80
Myrtle Warbler	90	76	90	81	83	70	95	86	84
Slate-colored Junco	97	69	94	94	89	81	96	81	99
Wilson's Warbler	84	71	82	84	78	72	93	91	82
Blackpoll Warbler	86	64	84	91	90	88	92	90	86
Ruby-crowned Kinglet	92	81	93	79	96	81	92	97	89
Swainson's Thrush	87	73	77	93	82	91	75	94	84
Common Yellowthroat	74	56	64	85	78	69	83	88	74

The peak period for banding occurred during week 6 (August 29 to September 4) with a weekly total of 872 birds (107.65 birds/100 net hours; Figure 2). The daily banding totals during this period were dominated by Yellow, Orange-crowned, Myrtle and Wilson's warblers.

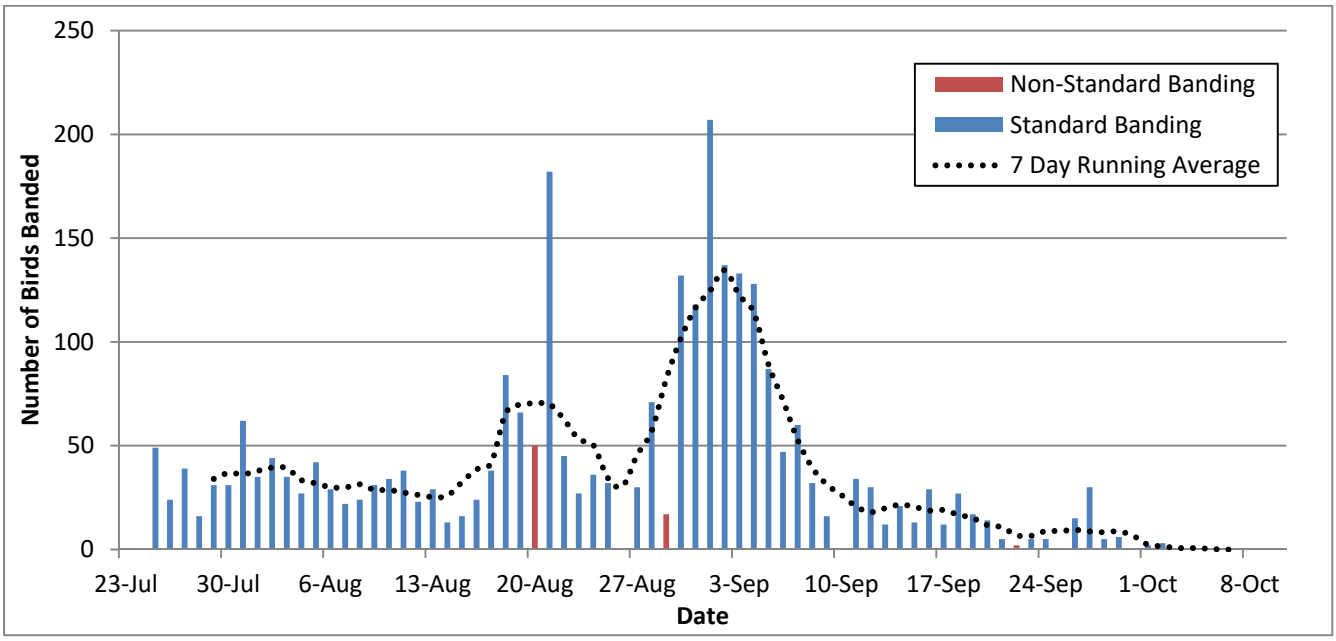

Figure 2. Summary of birds banded per day during the fall of 2016.

The 2016 banding total of 2,779 birds was below the 2009 to 2015 average of 3,164 birds but higher than the all-time low (since the station operated for the full fall season) of 2,429 during 2012. When the amount of mist netting effort is taken into consideration, the number of birds/100 net hours in 2016 (34.8) was also below the 2008 to 2015 average of 45.4 but higher than the all-time of 28.7 during 2012 (Figure 3).

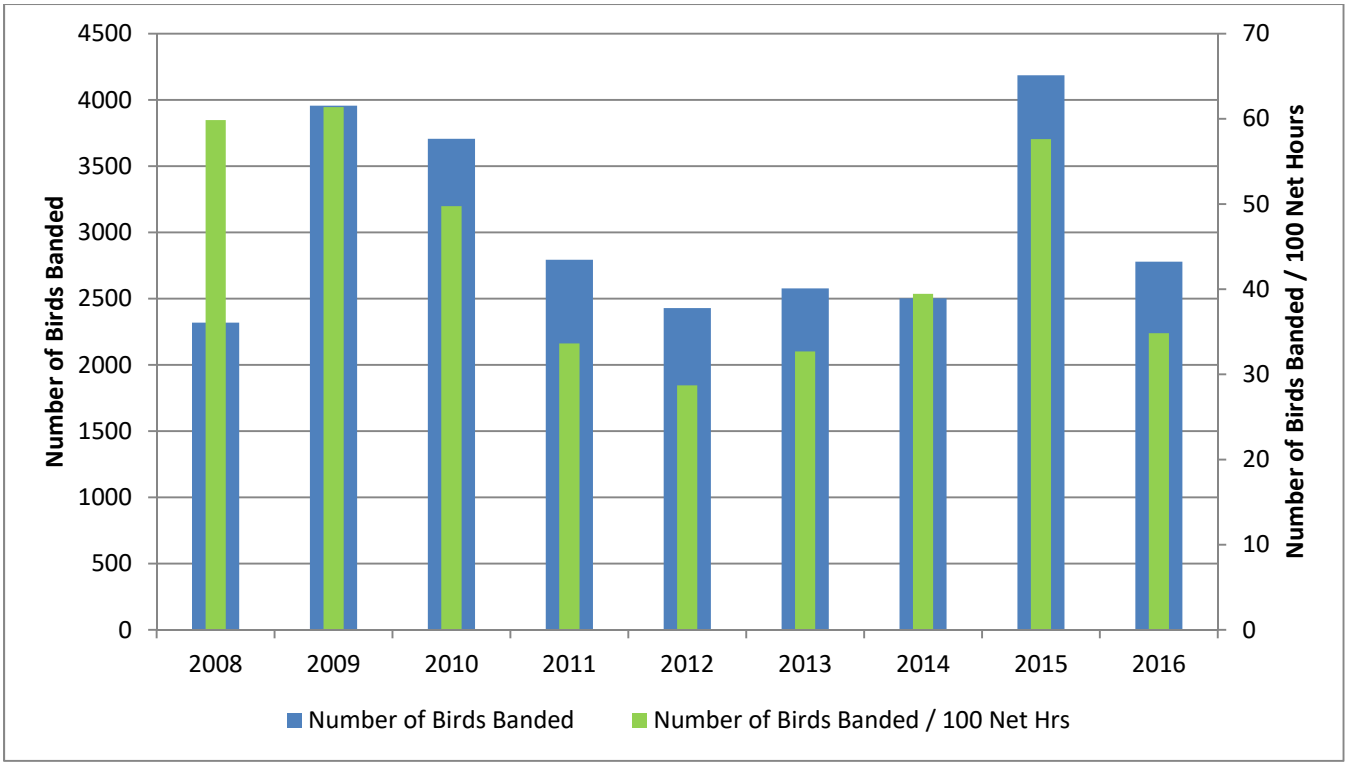

Figure 3. Summary of birds banded during the fall from 2008 to 2016.

The high level of consistency in effort across all standard mist nets (Figure 4) demonstrates the adherence to the observatory's monitoring protocol. Note that nets 7 10, 18 and 20 are located on the sparsely vegetated shoreline and are more frequently closed midway through the daily count period due to wind. Net 28 stands out in Figure 4 as it is an 18 m net meaning that the effort is multiplied by 1.5; this net is also frequently closed due to wind.

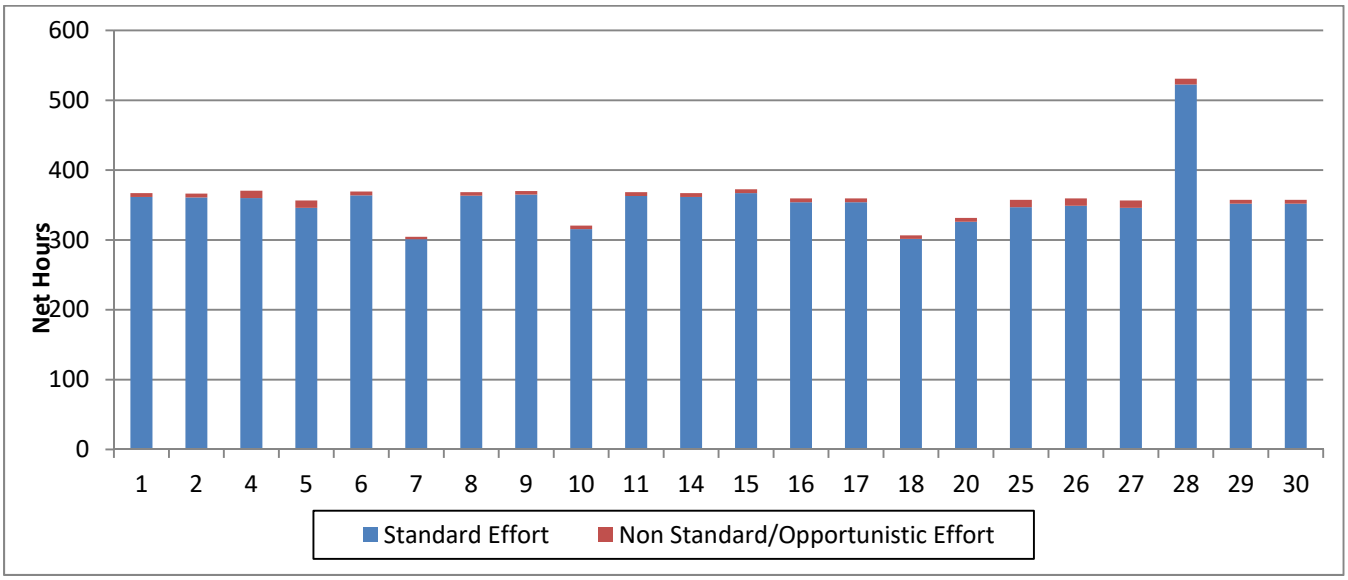

Figure 4. Summary of hours per mist net during the fall of 2016 (note net 28 is an 18 m net whereas all other nets are 12m).

The majority of birds and species moving through the count area that are captured in the nets pass directly along the shoreline of Teslin Lake. We see this in the highest capture rates in mist nets 10, 18,

20 and 28 (Figure 5) which are closest to the lake edge. This pattern is consistent with previous years. Net 2 is somewhat or an anomaly during 2016 with a high capture rate. This net is located adjacent to the small wetland within the count area and likely captured a number of migrants feeder in this productive habitat while moving through the area. Although a portion of the mist nets placed away from the lakeshore and in taller vegetation (nets 5, 25, 26 and 27) catch fewer birds per net-hour, these nets capture species such as Swainson's Thrush and Varied Thrush which are not typically caught on the lakeshore.

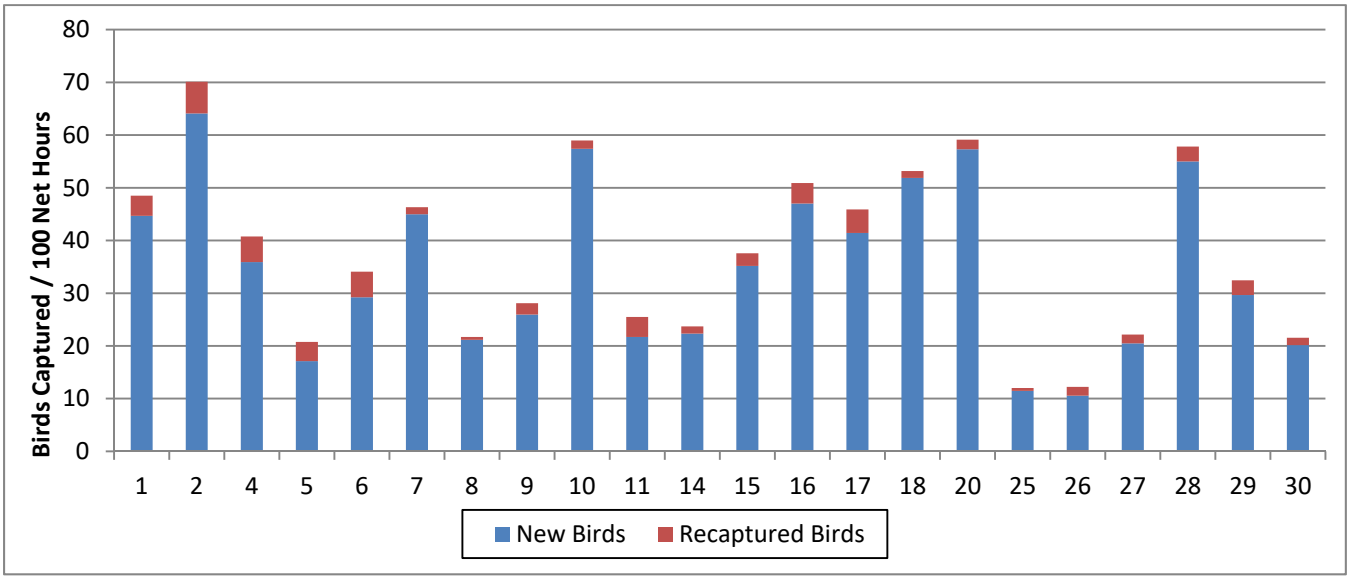

Figure 5. Number of birds banded per mist net during the fall of 2016.

3.3 Migration Timing

Generalized migration timing during 2016 as compared to the 2008 to 2015 average for temperate, neotropical and irruptive migrants/year round residents is presented in Figure 6. During 2016, the peak in fall migration for neotropical occurred in early September which was 1-2 weeks later than average. Temperate migrants typically migrate later than neotropical migrants and this was once again the case in 2016. The peak capture of temperate migrants occurred during mid-September which is consistent with data from previous years. Irruptive migrants banded during 2016 were dominated by White-winged Crossbills which were primarily captured between late August and mid-September.

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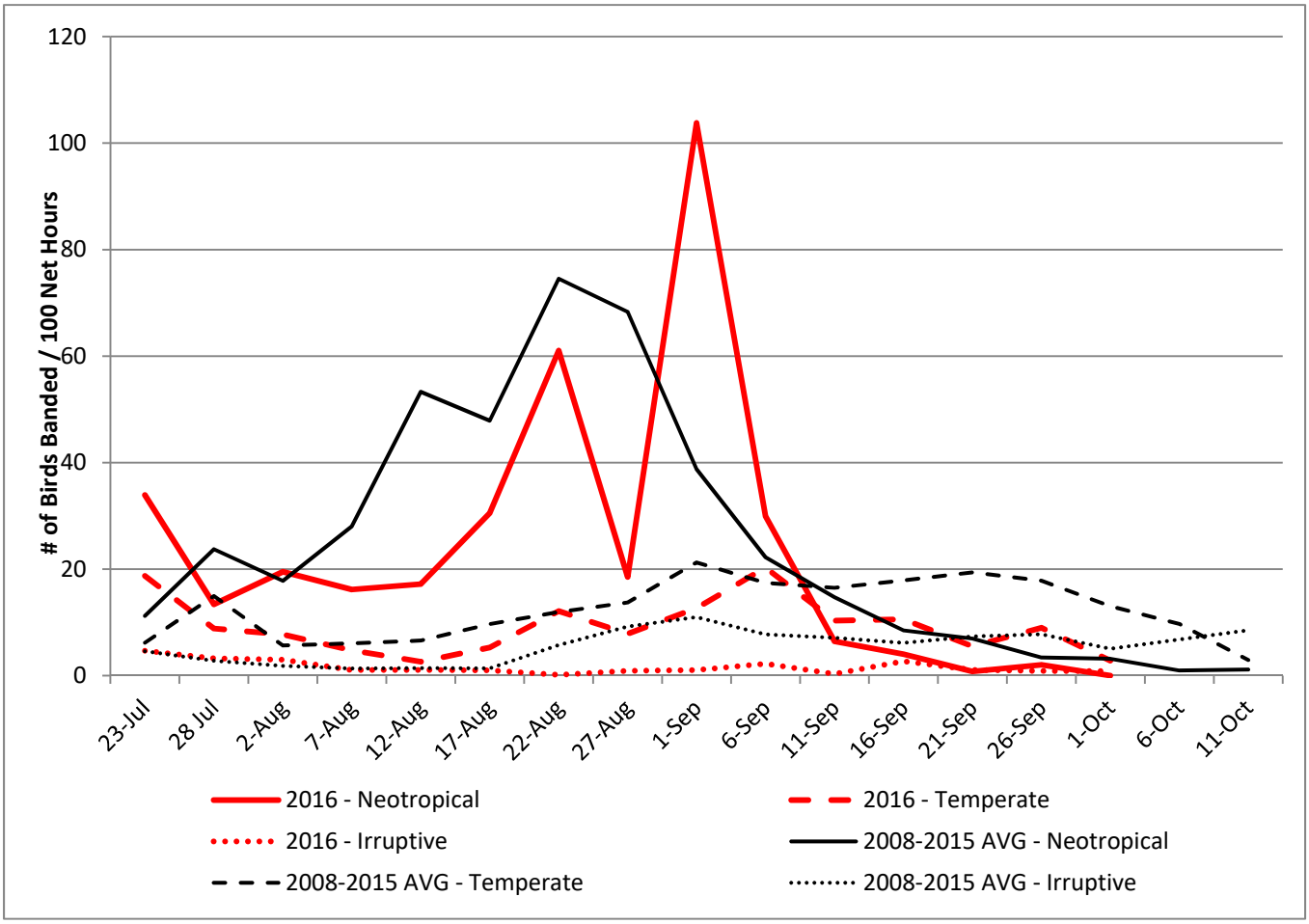

Figure 6. Generalized migration timing by species group during 2016 as compared to the average timing from 2008 to 2015.

3.4 Band Repeats, Returns & Recoveries

The proportion of birds caught that had been previously banded at the site in 2016 (band repeats) was low (4.7%) during the 2016 season (Table 7) which is identical to the long term average. These results indicate that there continues to be a very high turnover of migrants through the study site, particularly for species banded in high numbers. For the purpose of migration monitoring, this is the preferred scenario as there is a limited amount of double counting the same individuals on consecutive days.

Table 7. Summary of band repeats during the fall of 2016.

Species	# of Individuals Recaptured	% of 2016 Original Bandings	Maximum # of Days From Original Banding	Average # of Days From Original Banding
Sharp-shinned Hawk	1	10.0	2	-
Belted Kingfisher	3	75.0	2	1.5
Alder Flycatcher	4	0.8	8	3.0
Hammond's Flycatcher	4	21.1	4	2.3
Warbling Vireo	4	16.7	14	7.8
Black-capped Chickadee	7	29.2	68	24.4
Ruby-crowned Kinglet	2	2.2	1	-
Gray-cheeked Thrush	1	12.5	1	-
Swainson's Thrush	6	7.3	13	4.5
Hermit Thrush	1	14.3	1	-
Northern Waterthrush	9	26.5	15	6.8
Tennessee Warbler	2	15.4	2	2.0
Orange-crowned Warbler	7	1.9	12	3.9
Blackpoll Warbler	7	5.2	6	2.0
Myrtle Warbler	11	3.8	28	9.3
Yellow Warbler	34	7.6	12	2.1
Common Yellowthroat	6	10.5	5	2.3
American Redstart	4	26.7	4	2.0
Wilson's Warbler	5	2.9	4	2.0
American Tree Sparrow	3	15.0	1	1.0
Savannah Sparrow	1	5.9	1	-
Slate-colored Junco	12	5.2	7	3.8
White-winged Crossbill	3	6.5	12	6.0
TOTAL	137	4.9	68	4.7

Band returns (individuals banded at the site in previous years) typically represent individuals that breed within the study site as the likelihood of re-trapping migrants is relatively low. During 2016, the observatory had 4 band returns representing 2 species (Table 8).

Table 8. Summary of band returns during the fall of 2016.

Species	Band Number	Banded		Recaptured
		Date	Age – Sex [1]	Date in 2016
Black-capped Chickadee	2560-33587	25 Jul 2013	HY – U	11 Aug 2016
Black-capped Chickadee	2610-90865	29 Aug 2013	HY – U	31 Aug 2016
Slate-colored Junco	2511-91872	9 Aug 2014	HY – U	5 Aug 2016
Slate-colored Junco	2511-91897	26 Aug 2014	HY – F	6 Aug 2016

[1] HY – hatch year, AHY – after hatch year, ASY – after second year; M – male, F – female, U – unknown.

Foreign band recoveries are a very infrequent event; to date the observatory has had six such recoveries and also recovered one bird from another SOYBO study site (Table 9). The most recent recovery was an American Robin banded in August 2014 which was recovered near Dunburn, Saskatchewan in early April 2015. The longest distance band recovery to date is an Alder Flycatcher banded at Teslin Lake on August 24, 2009 and recaptured at Tacarcuna Nature Reserve in Colombia on April 29, 2011.

Table 9. Summary of foreign band returns for TLBO to date.

Species	Banded		Recovered	
	Location	Date	Location	Date
Yellow Warbler	Texas, USA	12 May 2008	Teslin Lake	9 Sep 2009
Alder Flycatcher	Teslin Lake	25 Aug 2008	SW Saskatchewan	12 Jun 2009
Sharp-shinned Hawk	Teslin Lake	14 Aug 2009	Boise, Idaho, USA	9 Oct 2010
Alder Flycatcher	Teslin Lake	24 Aug 2009	Sapzurro, Choco, Colombia	29 Apr 2011
Myrtle Warbler	Teslin Lake	7 Sep 2010	McIntyre Marsh Bird Banding Station – Whitehorse, YT	25 May 2013
American Robin	Teslin Lake	8 Aug 2014	Dunburn, Saskatchewan	11 Apr 2015

3.5 Molt Scoring

As supplementary information, data was collected on the stage of molt for large proportion of the birds banded. Although information on the prebasic molt (amount of juvenile plumage remaining) was collected for hatch year birds, a particular emphasis was placed upon collecting wing molt scores for molting adult individuals as this provides information on the progress of molt in relation to migration timing for various species.

Wing molt score is achieved by assigning each individual wing flight feather a score from zero (old feather remaining) to five (new feather fully grown) and adding them together. Note that birds symmetrically molt their wing feathers; however, the scores collected are typically on the right wing. During 2016, a total of 102 molt scores were obtained from 96 individuals of 17 species (Table 10). No additional analysis is provided here; however, additional analysis could be conducted to compare the stage of molt in comparison to timing. This can be done to compare the timing of molt between species and/or sex within species. For example, females typically molt later than males due to the energetic requirements for females which are typically greater than that for males.

Table 10. Summary of wing molt scores collected from adult birds during the fall of 2016.

Species	Number of Individuals Scored	Total Number of Molt Scores
Northern Flicker	2	2
Black-capped Chickadee	3	3
Ruby-crowned Kinglet	1	1
Swainson's Thrush	1	1
American Robin	2	2
Northern Waterthrush	2	5
Tennessee Warbler	1	1
Orange-crowned Warbler	6	6
Myrtle Warbler	20	22
Yellow Warbler	31	30
Blackpoll Warbler	10	10
Common Yellowthroat	1	1
American Redstart	4	6
Wilson's Warbler	2	2
Slate-colored Junco	2	2
White-winged Crossbill	6	6
Pine Siskin	2	2
TOTAL	96	102

3.6 Visual Migration Counts

The visual migration counts provide a method of estimating relative numbers of individuals in the migrant species that would not be caught in mist nets. The counts are especially useful in observing raptors in migration and also serve as a method for monitoring waterbirds, waterfowl and some species of passerines. Note that birds seen during the migration counts which are not in active

migration flight are not included in this section. Birds "in active migration flight" typically show a directed flight over the count area and do not appear to linger within the count area.

During the fall 2016 season, visual migration counts (standard & nonstandard) were conducted for 186.7 hours (Figure 7). Non-standard counts were limited to days when the total amount of observing effort was insufficient to constitute standard effort or to days where the allowable duration of standard effort was too high (i.e., extra effort).

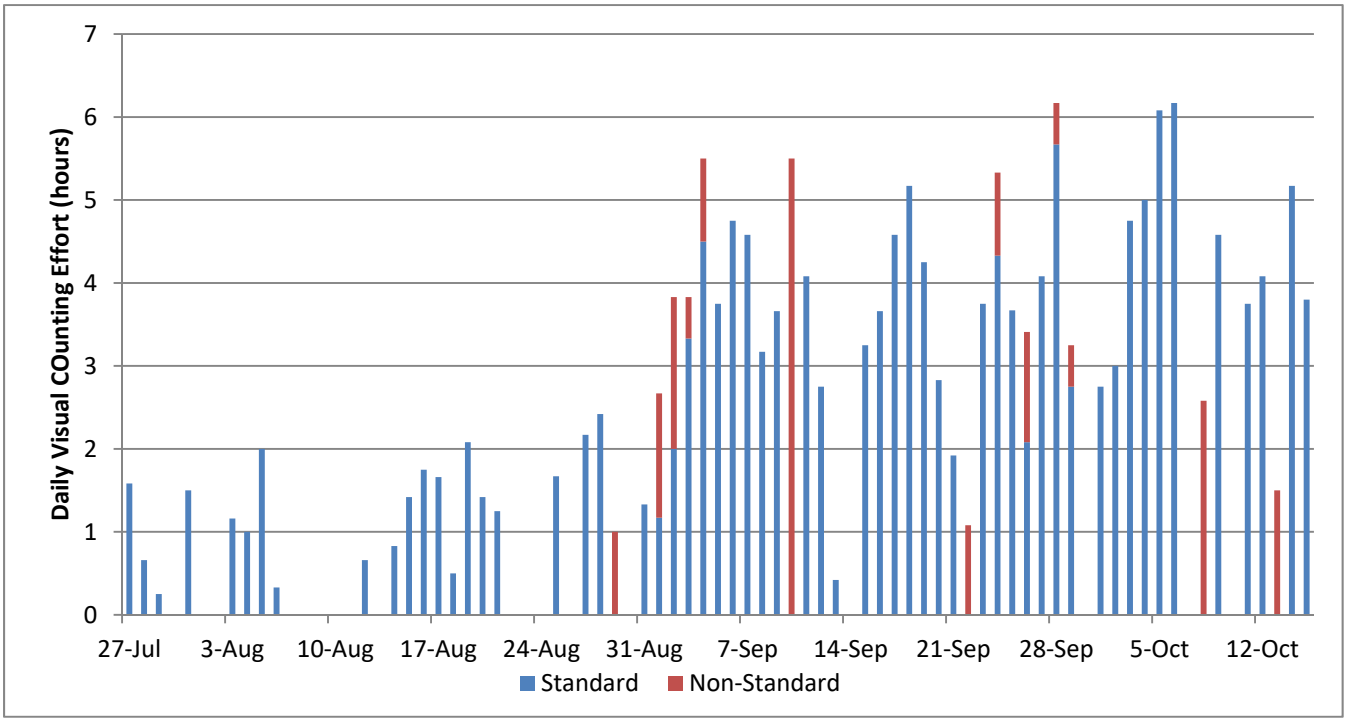

Figure 7. Visual counting effort, in hours each day, over the duration of the 2016 season.

A total of 38,056 birds were observed during the 2016 visual migration counts with passerines and waterfowl accounting for the largest proportion of the birds observed (Table 11). Compared to previous years, the number of birds observed during 2016 was the lowest to date, excluding 2009 when the visual migration counts were done on a trial basis only. Weather conditions drastically influence the number of birds observed on the visual migration counts and large numbers of birds can occasionally be observed in a short period of time.

Table 11. Summary of birds observed on the visual migration counts from 2009 to 2016.

Group	2016	2015	2014	2013	2012	2011	2010	2009	2009-2015 Average
Waterbirds[1] & shorebirds	1,043	3,878	721	2,166	1,583	1,072	3,491	4,927	2,281
Waterfowl	14,885	22,560	28,556	7,852	35,044	31,548	22,258	8,219	19,960
Raptors	1,946	4,211	2,300	2,466	1,977	3,680	1,710	1,612	2,326
Passerines[2]	20,182	11,797	23,397	28,839	21,408	37,951	16,277	11,000	19,187
TOTAL BIRDS OBSERVED	38,056	42,446	54,974	41,323	60,012	74,251	43,736	25,758	43,754
TOTAL BIRDS OBSERVED / HR	204	218	197	147	169	218	188	201	180
Visual Counting Effort (hrs)	*186.74*	*194.6*	*279.0*	*280.9*	*354.8*	*340.6*	*232.4*	*128.1*	*235.7*

[1] Waterbirds include loons, grebes, gulls and cranes.
[2] Includes woodpeckers.

There are, however, considerable differences between years in observational effort and some differences in the distribution of observational effort by week. Observations per hour for raptors and waterbirds show 2016 counts very near average for both species groups (Figure 8). We provide additional detail in the following sections.

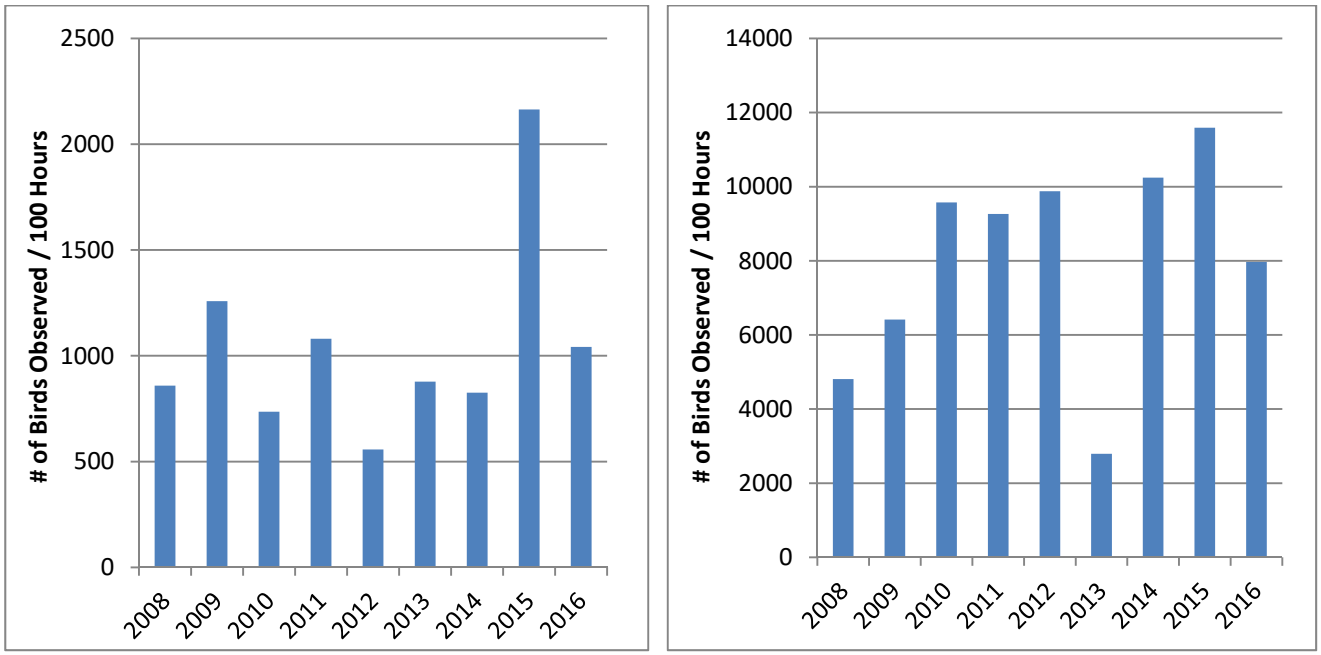

Figure 8. Number of raptors (left) and waterfowl (right) observed per 100 watching hours during 2016.

3.6.1 Waterbirds (loons, grebes, gulls)

A total of 1,176 waterbirds of 13 species were observed during the 2016 visual counts including 87 loons, 47 grebes, 765 cranes, and 277 gulls/terns/jaegers (Table 12). Most species of waterbirds are better suited to being monitored through the lake counts (Section 3.5) or through the daily estimated totals which combine all monitoring methods (visual migration and lake counts). Sandhill Cranes are

effectively monitored by the visual counts; however, the number of this species observed in 2016 was not relatively high.

Table 12. Summary of waterbird visual migrants observed during 2016.

Species	Total # Counted		
	Migration Counts	Incidental Migrants	TOTAL
Red-throated Loon	13	0	13
Pacific Loon	9	0	9
Common Loon	14	2	16
Yellow-billed Loon	1	0	1
Unidentified Loon	48	0	48
Horned Grebe	18	1	19
Red-necked Grebe	21	7	28
Sandhill Crane	765	0	765
Mew Gull	25	37	63
Herring Gull	0	90	90
Thayer's Gull	40	3	43
Bonaparte's Gull	2	0	2
Sabine's Gull	2	0	2
Arctic Tern	71	6	77
TOTAL	**1,016**	**146**	**1,176**

3.6.2 Waterfowl (geese, swans and ducks)

As in previous years, the visual migration counts were an effective and efficient way to monitor waterfowl migration. Although in some cases, portions of the large flocks of swans and/or geese were left as unidentified, most species were identified to species. We counted a total of 15,391 waterfowl during 2016 including 3,846 geese, 10,246 swans and 1,299 ducks (Table 13). Among the geese observed, Greater White-fronted Goose accounted for 59% of all individuals. The total of 453 Snow Geese was a relatively high count and a sighting of a blue Snow Goose was a first for the observatory.
In terms of swans, Tundra Swans were more common than Trumpeter Swans and accounted for 97% of the swans identified to species. The top 6 duck species observed included the following: Lesser Scaup (33% of all ducks), Surf Scoter (16%), Mallard (10%), Greater Scaup (6%), Northern Pintail (4%) and Common Merganser (4%).

Table 13. Summary of waterfowl visual migrants observed during 2016.

Species	Total # Counted		
	Migration Counts	**Incidental Migrants**	**TOTAL**
Greater White-fronted Goose	2,197	70	2,267
Snow Goose	453	0	453
'Blue' Snow Goose	1	0	1
Canada Goose	227	0	227
Unidentified Goose	819	79	898
Trumpeter Swan	333	2	335
Tundra Swan	9,010	284	9,294
Unidentified Swan	617	0	617
American Wigeon	16	0	16
Mallard	114	11	125
Northern Shoveler	8	0	8
Northern Pintail	57	0	57
American Green-winged Teal	17	0	17
Canvasback	43	0	43
Ring-necked Duck	8	0	8
Greater Scaup	78	0	78
Lesser Scaup	434	0	434
Unidentified Scaup	79	0	79
Surf Scoter	194	18	212
White-winged Scoter	41	1	42
Unidentified Scoter	1	0	1
Long-tailed Duck	5	0	5
Bufflehead	18	0	18
Barrow's Goldeneye	5	0	5
Common Goldeneye	29	0	29
Unidentified Goldeneye	19	0	19
Common Merganser	46	0	46
Red-breasted Merganser	1	0	1
Hooded Merganser	1	0	1
Unidentified Duck	55	0	55
TOTAL	**13,081**	**436**	**13,516**

3.6.3 Raptors

Most species of raptors are well monitored by the visual migration counts. In 2016, a total of 1,719 raptors were observed during the visual counts and as incidental "other visual migrants" representing 12 species (Table 14). The most numerous species observed were Harlan's Red-tailed Hawk (41% of all raptors), Sharp-shinned Hawk (32%), Northern Harrier (14%), American Kestrel (7%) and Golden Eagle (6%).

Table 14. Summary of raptor visual migrants observed during 2016.

Species	Total # Counted		
	Migration Counts	Incidental Migrants	TOTAL
Bald Eagle	50	0	50
Northern Harrier	224	9	233
Sharp-shinned Hawk	549	2	551
Northern Goshawk	5	0	5
Swainson's Hawk	3	0	3
Red-tailed Hawk (unspecified)	8	0	8
Red-tailed Hawk (Harlan's)	710	0	710
Rough-legged Hawk	57	0	57
Unidentified Buteo	5	0	5
Golden Eagle	96	0	96
Unidentified Eagle	1	0	1
American Kestrel	123	2	125
Merlin	52	0	52
Peregrine Falcon	18	2	20
Osprey	43	1	44
Unidentified Raptor	1	0	1
TOTAL	**1,708**	**11**	**1,719**

A breakdown of color morph data collected from 2010 to 2016 is shown in Table 15 and Table 16 for Rough-legged and Red-tailed hawks, respectively. The majority of Rough-legged Hawks observed were classified as light morph individuals. By far the most common Red-tailed Hawk was the Harlan's dark morph, while the Harlan's light morph was the second most common. These patterns have been very consistent from year to year. The observation of possible western, northern and eastern Red-tailed Hawks are also notable given the limited information on these subspecies in the Yukon.

Table 15. Summary of color morph data recorded for Rough-legged Hawks observed from 2010 to 2016.

Year	Dark Morph (%)	Light Morph (%)
2010	21.7	78.3
2011	13.5	86.5
2012	18.8	81.2
2013	11.1	88.9
2014	11.8	88.2
2015	8.5	91.5
2016	7.3	92.7

Table 16. Summary of color morph data recorded for Red-tailed Hawks observed from 2010 to 2016.

Year	Harlan's Dark Morph	Harlan's Light Morph	Western (*calarus*)	Northern (*abieticola*)	Eastern (*borealis*)
2010	95.1	4.3	0.5 (2 birds)		-
2011	95.0	4.6	0.2 (2 bird)		0.2 (2 birds)
2012	92.0	7.1	0.3 (1 bird)		0.6 (2 birds)
2013	88.4	10.3	0.6 (3 birds)		0.6 (3 birds)
2014	91.3	7.1	1.0 (7 birds)		0.5 (3 birds)
2015[1]	91.0	8.6	0.3 (7 birds)		0.1 (2 birds)
2016	92.9	6.4	0.3 (2 birds)	0.3 (2 birds)	

[1] One additional leucistic individual was observed and not included in this table.

We could reliably determine the age and sex of five species of visual migrants when viewing conditions were suitable (Table 17). Over the 5 years, most raptor species show consistently low proportions of juveniles.

Table 17. Summary of age and sex data collected for raptors observed on visual migration counts from 2010 to 2016. Note that additional individuals with an undetermined color morph age/sex categories are excluded.

Species	Year	Proportion of Individuals Counted (%)						
		Adult			Sub - adult	Immature	Juvenile	Female Plumaged (juv/female)
		Male	Female	Not Determined				
Bald Eagle	2010	-	-	42.3	32.1	11.6	14.1	-
	2011	-	-	14.7	37.3	33.3	14.7	-
	2012	-	-	54.3	33.7	12.0	0.0	-
	2013	-	-	28.2	58.3	6.3	7.3	-
	2014	-	-	35.6	40.2	11.5	12.6	-
	2015	-	-	14.5	60.0	14.5	10.9	-
	2016	-	-	32.0	28.0	32.0	8.0	-
Golden Eagle	2010	-	-	68.2	12.6	8.3	10.9	-
	2011	-	-	52.3	18.7	18.0	11.0	-
	2012	-	-	74.5	9.2	12.3	4.1	-
	2013	-	-	63.7	26.7	5.0	4.6	-
	2014	-	-	77.3	8.5	7.8	6.4	-
	2015	-	-	40.2	27.1	22.4	10.3	-
	2016	-	-	50.0	14.4	21.1	14.4	-
Northern Harrier	2010	11.3	12.2	-	-	-	37.1	39.3
	2011	8.9	10.7	-	-	-	26.5	53.9
	2012	13.9	13.1	-	-	-	26.4	46.6
	2013	12.0	14.3	-	-	-	22.3	51.5
	2014	16.4	16.4	-	-	-	19.5	47.7
	2015	6.8	8.2	-	-	-	22.1	62.9
	2016	8.5	8.1	-	-	-	24.6	23.2
Rough-legged Hawk	2010	38.0	23.0	11.5	-	-	27.6	-
	2011	28.3	37.1	21.0	-	-	15.2	-
	2012	25.7	25.7	18.9	-	-	30.1	-
	2013	28.9	35.6	17.1	-	-	18.6	-
	2014	24.6	33.9	15.4	-	-	26.1	-
	2015	10.5	24.4	5.8	-	-	59.3	-
	2016	29.7	8.1	32.4	-	-	29.7	
Harlans / Red-tailed Hawk [1]	2013	-	-	94.0	-	-	6.0	-
	2014	-	-	89.3	-	-	10.7	-
	2015	-	-	86.9	-	-	13.1	-
	2016	-	-	92.6	-	-	7.4	-

3.6.4 Shorebirds

As a group, shorebirds are not well monitored at this observatory due to the relatively low numbers of individuals observed (Table 18). In 2016, we counted a total of only 47 shorebirds of six species. This information can easily continue to be collected as incidental observations when counting other species (raptors, waterfowl, etc).

Table 18. Summary of shorebird visual migrants observed during 2016.

Species	Total # Counted		
	Migration Counts	Incidental Migrants	TOTAL
Semi-palmated Plover	0	12	12
Lesser Yellowlegs	0	3	3
Least Sandpiper	0	7	7
Unidentified Small Sandpiper (`peep`)	3	6	9
Long-billed Dowitcher	0	1	1
Red-necked Phalarope	0	1	1
Wilson's Snipe	0	1	1
Unidentified Shorebird	10	2	12
TOTAL	**13**	**34**	**47**

3.6.5 Owls, Woodpeckers and Passerines

A wide variety of passerines (20,686 individuals of 33 species) were counted during the 2016 visual migration counts (Table 19). A very large proportion of the passerines observed were large thrushes (American Robin, Varied Thrush, unidentified large thrush), finches (White-winged Crossbill, Common Redpoll, Pine Siskin), Yellow-rumped Warblers, Rusty Blackbirds, Bohemian Waxwings and American Pipits.

For most passerines, standard mist netting/banding provides the primary component of the daily species total; however, it can also be supplemented by the visual migration counts. For some species which migrate diurnally and are not captured in sufficient numbers by mist nets, and can be identified with relative ease when in flight, the migration counts likely provide the most reliable data. These include species such as the swallows, Townsend's Solitaire, American Robin, Varied Thrush, American Pipit, Bohemian Waxwing, Rusty Blackbird, Pine Grosbeak, Common Redpoll, Pine Siskin and White-winged Crossbill.

Table 19. Summary of owls, woodpecker and passerine visual migrants observed during 2016.

Species	Total # Counted		
	Migration Counts	Incidental Migrants	TOTAL
Belted Kingfisher	1	0	1
Downy Woodpecker	0	1	1
Northern Flicker	1	0	1
Unidentified Woodpecker	1	0	1
Northern Hawk Owl	1	0	1
Unidentified Large Flycatcher	1	0	1
Say's Phoebe	1	0	1
Tree Swallow	3	2	5
Violet-green Swallow	18	1	19
Bank Swallow	52	12	64
Northern Rough-winged Swallow	0	1	1
Cliff Swallow	4	2	6
Barn Swallow	6	3	9
Unidentified Swallow	217	3	220
Mountain Bluebird	3	0	3
Townsend's Solitaire	11	0	11
American Robin	2,567	0	2,567
Varied Thrush	680	0	680
Unidentified Large Thrush	427	0	427
American Pipit	200	19	219
Bohemian Waxwing	347	30	377
Lapland Longspur	26	5	31
Orange-crowned Warbler	1	1	2
Yellow Warbler	9	15	24
Myrtle Warbler	800	91	891
Blackpoll Warbler	14	28	42
Wilson's Warbler	0	2	2
Unidentified Warbler	99	32	131
Chipping Sparrow	0	17	17
Savannah Sparrow	1	4	5
Rusty Blackbird	420	0	420
Red-winged Blackbird	1	0	1
Pine Grosbeak	57	0	57
Red Crossbill	1	0	1
White-winged Crossbill	2,299	95	2,484
Unidentified Crossbill	1,502	0	1,502
Pine Siskin	137	21	158
Common Redpoll	1,645	58	1,703
Unidentified Small Finch	1,318	0	1,318
Unidentified Small Passerine	7,271	11	7,282
TOTAL	**20,142**	**454**	**20,686**

3.7 Lake Counts

The lake counts provide monitoring data for various species of shorebirds, loons, grebes, waterfowl, and gulls/terns/ jaegers. Fourteen shorebird species were observed during the lake counts with all species observed in relatively low numbers with the exception of Spotted Sandpiper. Although the total number of individuals observed was relatively low, the species diversity was modest with three locally rare species detected including: Sharp-tailed Sandpiper, Western Sandpiper and Red Phalarope.

The majority of loons and grebes counted at the observatory are observed on the lake counts and this was once again the case during 2016 with a total of 686 loons and 1,061 grebes (Table 20). Geese and swans were observed in very low numbers during the lake counts; these species are typically observed flying over the site only (i.e. are visual migrants). However, for some duck species (scoters and mergansers), the lake counts record data to supplement the visual migration counts (Table 20). Only small numbers of dabbling and diving ducks are seen mostly due to scarcity of suitable stopover and feeding habitats near the observatory. As a group, gulls, terns and jaegers are well monitored through the use of the lake counts; species of this group are the most commonly recorded birds using this method. A total of 9 species of gulls/terns/jaegers were observed on the 2016 lake counts including the observatory's first Iceland Gull (Table 20).

Table 20. Summary of shorebirds (left), waterbirds (middle) and waterfowl (right) observed on the lake counts during 2016. One bird day represents one individual on one day; two bird days could represent single birds on two days or two birds on the same day.

Species	Total # of Bird Days	Species	Total # of Bird Days	Species	Total # of Bird Days
American Golden-Plover	1	Pacific Loon	255	Canada Goose	146
Semi-palmated Plover	28	Common Loon	312	Trumpeter Swan	2
Killdeer	3	Red-throated Loon	118	Tundra Swan	30
Sanderling	1	*Unidentified Loon*	1	*Unidentified Swan*	30
Least Sandpiper	26	Horned Grebe	65	American Wigeon	4
Pectoral Sandpiper	1	Red-necked Grebe	996	Mallard	28
Sharp-tailed Sandpiper	1	Great Blue Heron	1	Green-winged Teal	10
Semi-palmated Sandpiper	2	Mew Gull	87	Lesser Scaup	37
Western Sandpiper	1	Herring Gull	2,859	Greater Scaup	8
Unidentified 'Peep'	6	Sabine's Gull	3	Northern Pintail	
Red-necked Phalarope	3	Thayer's Gull	79	Surf Scoter	116
Red Phalarope	2	Glaucous Gull	1	White-winged Scoter	37
Spotted Sandpiper	98	Iceland Gull	1	Long-tailed Duck	2
Solitary Sandpiper	8	Bonaparte's Gull	6	Harlequin Duck	5
Lesser Yellowlegs	1	Arctic Tern	51	Common Goldeneye	24
		Parasitic Jaeger	2	Barrow's Goldeneye	11
		Unidentified Jaeger	1	*Unidentified Goldeneye*	5
				Common Merganser	304
				Red-breasted Merganser	176
				Unidentified Duck	52
TOTAL	**182**	**TOTAL**	**4,838**	**TOTAL**	**1,027**

3.8 Special Projects

3.8.1 Owl Banding

Call playback was used to target owls on 8 evenings (113.25 net hours) and a total of 2 Boreal Owls were banded (
Table 21). The number of owls banded during 2016 was considerably lower than the high of 40 Borealsand 2 Northern Saw-whets but very similar to the results from2015 and 2013. The capture rate of 1.8 owls per 100 net hours during 2016 was the lowest to date since full scale site testing for owl banding began during 2014 (2015 – 3.9 owls/100 net hours and 2014 – 25.0 owls/100 net hours). These differences between years are not unexpected given that owl populations and reproductive output are known to vary from year to year due to changes in prey (small mammal) abundance. These differences between years are likely to be exacerbated within the owl banding results as most owls captured are juvenile birds and these individuals are most likely to migrate/errupt during years when the owls have high breeding success. There was also high variation in the captures between different evenings in 2014 when total captures were high and we may need to increase the number of evenings of sampling during future years.

Table 21. Summary of 2016 owl banding results.

Species	Date								TOTAL
	24 Aug	2 Sep	5 Sep	7 Sep	8 Sep	10 Sep	30 Sep	1 Oct	
Total Net Hours	11.25	10.00	10.00	10.00	12.5	12.5	20.00	27.00	113.25
Boreal Owl (banded)	1	0	0	1	0	0	0	0	2

3.9 Interesting & Notable Captures / Observations

The vast majority of birds banded and observed at Teslin Lake in 2016 were species which are common and widespread north and west of the study site. These common species will be the primary focus of the long term species trend analysis to be conducted following additional years of data collection. In addition to common species, the observatory continues to add to the knowledge base for rare and uncommon bird species in the Yukon, and some interesting patterns are outlined in the following sections.

Snow Goose (Blue Form)

The observatory's first record of a blue Snow Goose was an individual observed during the September 26 visual migration count. The color phase of Snow Goose is considered casual in the southern Yukon

during spring migration; however, the 2016 record at TLBO provided the first fall record of this species in the region.

Hooded Merganser

A single Hooded Merganser was observed during the October 5 visual migration count and provided the fourth record of this species at the observatory to date. This species is rare but regular in the southern Yukon during fall migration.

Great Blue Heron

The observatory's first Great Blue Heron was observed on the gull nesting colony across the lake from the study site on August 12, 2016. This species is considered to be rare in the southern Yukon but has been observed in the Teslin area in the past.

Swainson's Hawk

Prior to the start of visual migration counts at the observatory in 2008, fall records of this species in the Yukon were very sparse. Since the start of visual migration counts, the species has been documented annually at the observatory in low numbers; however, the numbers observed during 2015 far surpassed the counts from previous years. A total of 3 individuals were observed on the visual migration counts on 3 days between August 31 and September 2 with single birds on all days The numbers observed in previous years included: 108 – 2015, 13 – 2014, 3 – 2013, 12 – 2012, 23 – 2011, 10 – 2010, 17 – 2009 and 3 – 2008. This species appears to be a relatively early migrant compared to other raptor species with nearly all records between August 20 and September 5.

Sharp-tailed Sandpiper

The observatory's first Sharp-tailed Sandpiper was observed on September 8 lake count and was located near the creek mouth within the count area. This species is considered to be very rare but annual in the southern Yukon during fall migration and has been observed in the Teslin area (Nisutlin Delta) in the past.

Red Phalarope

A new species for the observatory, single Red Phalaropes were observed on the September 24 and October 2 lake counts. This species is considered casual (not observed annually) in the southern Yukon during fall migration.

Glaucous Gull

An arctic nesting gull species, Glaucous Gull has also been observed at the site annually since the fall of 2008 with a total of 73 records to date (Table 22).

Table 22. Summary of Glaucous Gull observations from 2008 to 2016.

Year	Number of Days Observed	Total Bird Days	First Date Observed	Last Date Observed
2008	2	2	August 27	September 19
2009	2	2	August 1	August 29
2010	2	2	October 4	October 18
2011	13	13	September 16	October 24
2012	29	29	August 18	October 26
2013	13	13	August 27	September 19
2014	3	3	September 23	October 2
2015	8	8	September 2	October 19
2016	1	1	September 15	-
ALL	73	73	August 1	October 19

Iceland Gull

The observatory's first Iceland Gull was observed on the September 26 lake count; this species is considered to be casual in the southern Yukon during the fall.

Sabine's Gull

Sabine's Gull was observed on three days during 2016 with a total of 5 bird days. Three individuals were observed on the lake counts including 2 on September 24 and 1 on October 5. A pair of individuals were also observed on the October 6 visual migration count. This species is regular but considered rare in the southern Yukon during fall migration and has been observed annually at the observatory since fall operation began during 2008 with the exception of 2013 and 2015.

Parasitic Jaeger

Prior to the initiation of fall migration monitoring at Teslin Lake in 2008, fall migration records of this species in the southern Yukon were limited to a few incidental sightings primarily from large lakes. It has become apparent that this species is a regular fall migrant on Teslin Lake; however, the number of individuals observed is variable between years. The number of individuals observed during 2016 (2) was the lowest annual today and considerably lower than the 2008 to 2015 average of 35 bird days (Table 23).

Table 23. Summary of Parasitic Jaeger observations from 2008 to 2016.

Year	Number of Days Observed	Total Bird Days	First Date Observed	Last Date Observed
2008	28	72	August 7	September 24
2009	11	16	August 24	September 25
2010	20	37	September 1	October 15
2011	9	12	September 2	October 11
2012	21	35	August 8	October 1
2013	25	53	August 24	September 23
2014	21	39	August 6	September 27

2015	4	12	August 31	September 12
2016	2	2	September 16	September 17
ALL	141	278	August 8	October 15

Rufous Hummingbird

The observatory's second Rufous Hummingbird was observed on July 27 and presumably the same individual was captured on July 29. The bird released un-banded as station personnel did not have the specialized bands on hand for hummingbirds. The observatory's first record of this species was a male captured and released unbanded on May 13, 2007. This species is encountered in the southern Yukon on an annual basis and it considered a rare species in the region. Of particular interest, there were more observations of this species in the southern Yukon during the summer of 2016 as compared to previous years.

Western Flycatcher

The observatory's second record of a Western Flycatcher (Pacific-slope Flycatcher/Cordilleran Flycatcher) a hatch year individual banded on August 4, 2016. This individual was a highly probable Pacific-slope Flycatcher based upon plumage characteristics; however, it could not be definitively determined. The observatory's first Western Flycatcher was also a hatch year bird banded on August 26, 2012. There are a small number of records of this species elsewhere in the southern Yukon; however, the species is not encountered annually and it is therefore considered casual in the region.

Yellow-bellied Flycatcher

Yellow-bellied Flycatcher is likely the least understood *Empidonax* flycatcher in the Yukon in terms of distribution and abundance. Partially due to identification difficulties with other closely related species, there are relatively few records of this species during migration aside from the Teslin Lake and Albert Creek bird observatories where nearly all of the records are of birds captured in the mist nets. This species is a late spring and an early fall migrant; the latest record to date is September 4 (Table 24).

Table 24. Summary of Yellow-bellied Flycatchers banded from 2008 to 2016.

Year	Number Banded		Earliest Date	Latest Date
	Juvenile	Adult		
2008	9	1	August 11	August 22
2009	8	0	August 4	August 23
2010	11	0	July 29	August 25
2011	7	0	August 12	September 4
2012	8	1	August 2	August 23
2013	11	0	August 11	August 26
2014	2	1	July 30	August 15
2015	11	0	July 29	August 28
2016	15	1	July 27	September 4

TOTAL	82	4	July 27	September 4

American Redstart

In the Yukon, American Redstart is most common in the southeast portion of the territory; however, it occurs annually in lower numbers further west near Teslin, Whitehorse and Haines Junction. Following the establishment of the fall migration monitoring at the observatory in 2008, it became apparent that this species is much more common in the region than initially thought. To date, 265 individuals have been banded at the station in fall, of which 190 have been juveniles (Table 25). This species is most frequently observed during late July and August although there are a few records in mid to late September and even early October (latest October 5 - 2015). In 2016, the species was observed on 21 days (33 bird days) from July 25 to September 5 and a total of 15 individuals (10 juvenile, 5 adult) were banded. These values represent the fewest individuals of this species banded and observed since the observatory began full spring operation during 2010.

Table 25. Summary of American Redstarts banded at the observatory from 2008 to 2016.

Year	# of Days Observed	# of Bird Days	# Banded		Early Date[1]	Late Date	High Count
			Juvenile	Adult			
2008	13	15	5	5	7 Aug	18 Sep	2 – many
2009	26	99	34	9	1 Aug	19 Sep	9 – 6 Aug
2010	24	47	25	5	16 Jul	6 Sep	6 – 26 Jul
2011	36	137	28	12	16 Jul	26 Sep	10 – 30/31 Jul
2012	28	66	12	10	22 Jul	16 Sep	8 – 5 Aug
2013	30	62	28	5	25 Jul	11 Sep	4 – 25/29 Jul
2014	23	48	23	2	28 Jul	5 Sep	6 – 31 Jul
2015	42	76	25	22	26 Jul	5 Oct	5 – 29 Jul
2016	21	33	10	5	25 Jul	5 Sep	4 – 25/26 Jul
TOTAL	243	583	190	75	16 Jul	5 Oct	-

[1] Note that during 2008 and 2009, the observatory did not begin fall migration monitoring until August 7 and August 1, respectively.

Song Sparrow

The observatory's second Song Sparrow, a hatch year bird, was banded on August 18, 2016. The 2016 individual and the first record of this species (August 28, 2010) were both of one of the dark coastal subspecies. This species is observed almost annually in the southern Yukon and is considered rare in the region.

3.9.1 Chickadees

Chickadees are considered year-round residents, but the observatory has documented Boreal Chickadee irruptions in five of the last nine years with variation in the magnitude of irruptions between years (Table 26). The high number of individuals banded and observed in some years indicates that a substantial number of birds are involved in these irruptions. The relative proportion of the species encountered is likely an indication of the relative abundance in the southern Yukon; however, it is possible that certain species may be more likely to stage fall irruptions. Of particular interest, nearly all chickadees banded are hatch year individuals. Also note that Black-capped Chickadee is the only chickadee species which breeds within the study site and therefore a portion of the individuals banded are probable local residents/offspring.

Table 26. Summary of chickadees banded and observed at the observatory from 2008 to 2016.

Year		Boreal Chickadee	Black-capped Chickadee	Mountain Chickadee	Chestnut- backed Chickadee	Hybrid Chickadee
2008	# Banded	128	57	15	1	1
	# of Bird Days	293	172	20	1	1
2009	# Banded	831	26	11	-	-
	# of Bird Days	1,612	221	24	-	-
2010	# Banded	-	22	-	-	-
	# of Bird Days	12	295	-	-	-
2011	# Banded	233	92	2	-	-
	# of Bird Days	486	270	3	1	-
2012	# Banded	142	65	1	-	12
	# of Bird Days	230	231	5	-	-
2013	# Banded	24	33	-	-	-
	# of Bird Days	40	209	1	-	-
2014	# Banded	3	16	-	-	-
	# of Bird Days	9	157	-	-	-
2015	# Banded	131	31	4	-	-
	# of Bird Days	304	169	11	-	-
2016	# Banded	40	24	-	-	-
	# of Bird Days	62	162	-	-	

3.10 Species of Conservation Concern

In conjunction with the other Yukon Bird Observatories field stations, all Rusty Blackbirds captured were fitted with a color band (light blue) in addition to the regular numbered leg band. As each observatory uses a different color, the color bands help to identify the origin of a re-sighted individual without the need to recapture it. Additionally, from 2008 to 2010 a feather was collected from each Rusty Blackbird captured. Feather samples were analyzed for stable isotopes in an effort to make linkages between breeding and wintering grounds of this species. During the fall of 2016, 5 individuals were banded (4 hatch year, 1 after hatch year) and the species was observed on 42 days with a total of 517 bird days (incudes 420 visual migrants).

In addition to Rusty Blackbirds, other species of conservation concern (COSEWIC and Yukon General Status) encountered included the following (numbers in brackets - # banded/# of bird days): Horned Grebe (0/84), American Kestrel (0/125), Peregrine Falcon (0/20), Red-necked Phalarope (0/4), Olive-sided Flycatcher (0/2), Bank Swallow (0/64) and Barn Swallow (0/10).

3.11 Visitors and Volunteers

Once again the observatory hosted numerous visitors and volunteers. On most days of operation, adequate personnel were available onsite to assist with the banding operation. This was largely due to the commitment of long-term volunteers who provide valuable assistance at the observatory. During 2016, the observatory hosted long-term volunteer Sonja Panozzo from British Columbia who volunteered for 345 hours (53 days). Qualified volunteers such as Sonja are necessary to allow for the observatory to be successful over the long term. During 2016, the observatory recorded a total of 1,422 hours of observer effort (paid and volunteer) by 25 individuals. A total of 74 individuals visited the observatory and tallied a total of 107 visitor hours. Visitors were defined as those people who visited the observatory (often for a short time) and did not take part in activities at the observatory. Volunteers were those people which took part in the operation of the observatory (often extensively) without being financially compensated. Paid hours were spent by individuals being paid to be at the observatory. This category includes the Banders In Charge Jukka Jantunen and Ted Murphy-Kelly. Note that the values shown for "paid hours" only include those spent at the observatory and do not include the extensive amount of travel to and from the site, data entry, data analysis, report writing and other communication of the observatory's results.

Table 27. Hours spent at the observatory by volunteers and paid observers during 2016.

Paid		Volunteer	
# of Individuals	**Hours**	**# of Individuals**	**Hours**
2	556	23	866

Table 28. Hours spent at the observatory by visitors during 2016.

Yukon		Canada		USA		Other International	
#	**Hours**	**#**	**Hours**	**#**	**Hours**	**#**	**Hours**
26	101.3	21	43.8	25	52.0	2	5.5

In comparison to previous years, the total number of volunteer hours was less than the record high of 1,267 during 2015 but near average compared to previous years (Figure 9). The total visitor hours was near the previous high of 210 hours during 2009. The amount of paid hours has been declining over time and this is primarily due to having few paid personnel at the observatory on a daily basis. This has been possible in recent years due to the increased availability of qualified volunteers to assist with day to day activities at the observatory.

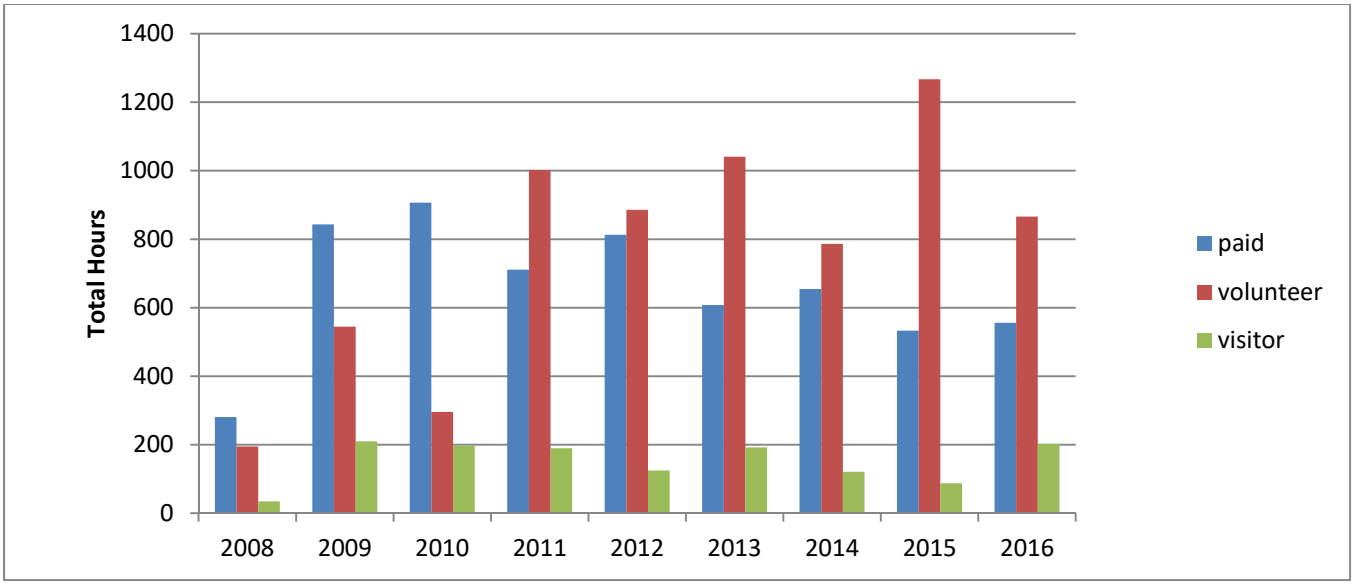

Figure 9. Volunteer and visitor hours at the observatory from 2008 to 2016.

4.0 Conclusion

The results from the operation of the Teslin Lake Bird Observatory in 2016 have continued to add to the knowledge of numerous aspects of bird biology in the Yukon, including: species distribution, migration timing and productivity. The location of the study site has proven to be effective for monitoring songbird migration. The primary reason for this is the close proximity of the site to Teslin Lake. As the lake is a very large body of water which migrating landbirds are hesitant to cross, many birds concentrate along the lakeshore and pass directly through and over the study site. On numerous occasions, flocks of migrating birds have been observed moving along the lakeshore and thus have yielded some very impressive banding and observation totals at the observatory.

Following seven years of fall migration monitoring at the observatory, the ability to monitor songbirds has been well demonstrated by the large numbers of migrants observed and banded on an annual basis. The results gathered this season also confirm the previous assumption that few birds stopover at the study site for extended periods of time. The majority of birds simply pass through the site while in migration and this is supported by the low proportion of band repeats within each season.

The visual migration and lake counts increase the number of bird species which may be monitored at the observatory and are now a key component of the observatory's activities. Together they serve to collect monitoring data for species not banded (or banded only in low numbers) including: waterfowl, loons/grebes, gulls/terns, raptors and some species of passerines, particularly American Robin, Varied Thrush, American Pipit, Rusty Blackbird, Common Redpoll and Pine Siskin. The raptors are a primary focus of these counts as these species are readily observed and identified from a distance. The ability to collect data on ages and color morphs of these species make this data even more valuable.

Over the long term, the data collected at the observatory will be used to calculate species trends to determine the status on bird populations. Given the location of the observatory, the birds counted at the site are known to originate in the Yukon and Alaska. Species trend data from this relatively small catchment area will be useful when used in combination with more southerly bird observatories which monitor birds from a much larger catchment area. For trend analysis to be possible, the observatory must continue to operate on an annual basis for at least 10 years (until 2017) and continue monitoring using standardized methods (i.e., follow the monitoring protocol) that are consistent with what has been done during the previous six years.

The observatory continues to be successful in attracting members of the public to the observatory to learn about birds and bird migration. During 2016, numerous individuals visited the observatory and were given an introduction to birds, their migration and methods used for ornithological data collection.

4.1 Recommendations

The following list summarizes a number of recommendations for the future operation of the Teslin Lake Bird Observatory.

- Continue standardized monitoring to allow for the future analysis of species trends.
- Continue the owl banding program with more regular and frequent effort.
- Continue to expand species specific banding projects at the observatory, particularly for species such as woodpeckers and potentially raptors which are under captured in the standard mist nets.
- Work with project partners to build an interpretive sign in the adjacent campground to attract camp ground visitors to the observatory,
- Make efforts to attract additional qualified volunteers to assist with activities at the observatory.
- Make efforts to diversify the funding base for the bird observatory to ensure long term operation.

Appendix A – Species Checklist

Table A1. Birds banded and observed (✓) at Teslin Lake Bird Observatory from 2008 to 2016. Note that observations were not collected during the fall of 2005, 2006 and 2007; observatory was located at a different location on Nisutlin Bay during 2005.

SPECIES	2005		2006		2007		2008		2009	2010	2011	2012	2013	2014	2015	2016	SPRING TOTAL	FALL TOTAL	ALL TIME TOTAL	
	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall				Taxon Order
Bean Goose										✓							-	-	-	237
Greater White-fronted Goose	✓		✓				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	246
Snow Goose					✓		✓	✓		✓	✓	✓	✓	✓	✓	✓	-	-	-	265
Cackling Goose												✓					-	-	-	285
Canada Goose	✓		✓		✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	296
Trumpeter Swan	✓		✓		✓		✓		✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	328
Tundra Swan			✓		✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	330
Bewick's Tundra Swan										✓	✓						-	-	-	332
Gadwall	✓						✓								✓		-	-	-	408
American Wigeon	✓		✓				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	414
Mallard	✓		✓		✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	424
Blue-winged Teal							✓										-	-	-	461
Northern Shoveler	✓						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	473
Northern Pintail	✓				✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	486
American Green-winged Teal	✓		✓					✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	509
Canvasback								✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	552
Redhead									✓	✓				✓	✓		-	-	-	553
Ring-necked Duck	✓						✓	✓		✓	✓	✓	✓	✓	✓	✓	-	-	-	556
Greater Scaup								✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	570
Lesser Scaup							✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	576
Harlequin Duck							✓	✓		✓	✓	✓	✓	✓		✓	-	-	-	598
Surf Scoter	✓						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	602
White-winged Scoter	✓							✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	603
Long-tailed Duck							✓			✓	✓	✓	✓	✓	✓	✓	-	-	-	612
Bufflehead	✓				✓					✓	✓	✓	✓	✓		✓	-	-	-	613
Common Goldeneye	✓		✓		✓			✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	614
Barrow's Goldeneye							✓		✓	✓	✓		✓	✓	✓	✓	-	-	-	618
Hooded Merganser									✓	✓		✓				✓	-	-	-	622
Common Merganser	✓		✓		✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	629
Red-breasted Merganser	✓		✓		✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	637
Ruffed Grouse	✓		✓		✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	1552
Spruce Grouse	✓						✓		✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	1571
Red-throated Loon	✓						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	1677
Pacific Loon								✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	1681
Common Loon	✓		✓		✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	1683
Yellow-billed Loon										✓	✓	✓		✓		✓	-	-	-	1684
Horned Grebe								✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	1730

SPECIES	2005		2006		2007		2008		2009	2010	2011	2012	2013	2014	2015	2016	SPRING TOTAL	FALL TOTAL	ALL TIME TOTAL	Taxon Order
	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall				
Red-necked Grebe	✓		✓					✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	1733
Western Grebe											✓						-	-	-	1752
Double-crested Cormorant							✓										-	-	-	2214
Great Blue Heron																✓	-	-	-	2312
Turkey Vulture														✓			-	-	-	2549
Osprey	✓		✓		✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	2565
Golden Eagle							✓	✓	✓	✓	✓	✓	✓	✓	✓		-	-	-	2793
Northern Harrier	✓		✓		✓		1	✓	✓	✓	✓	✓	✓	✓	✓	✓	1	-	1	2861
Sharp Shinned hawk	✓		✓		2		1	10	23	14	7	13	6	14	25	10	3	122	125	3020
Northern Goshawk							✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	3050
Bald Eagle	✓		✓		✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	3094
Swainson's Hawk							✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	3209
Red-tailed Hawk			✓				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	3213
Rough-legged Hawk							✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	3232
Sandhill Crane								✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	3797
Black-bellied Plover											✓			✓			-	-	-	3895
American Golden-Plover							✓			✓	✓		✓		✓	✓	-	-	-	3899
Semipalmated Plover	✓				✓			✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	3997
Killdeer	✓		✓		✓		✓			✓	✓					✓	-	-	-	4019
Upland Sandpiper													✓		✓		-	-	-	4078
Black Turnstone												✓			✓		-	-	-	4116
Stilt Sandpiper													✓				-	-	-	4137
Sanderling								✓	✓	✓	✓	✓		✓	✓	✓	-	-	-	4143
Baird's Sandpiper							✓	✓	✓		✓		✓		✓		-	-	-	4165
Least Sandpiper					✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	1	-	1	1	4168
Pectoral Sandpiper					✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	4173
Semipalmated Sandpiper								✓	✓	✓	✓	✓	✓		✓	✓	-	-	-	4176
Western Sandpiper											✓					✓	-	-	-	4177
Short-billed Dowitcher							✓								✓		-	-	-	4181
Long-billed Dowitcher								✓	✓	✓	✓	✓		✓	✓	✓	-	-	-	4185
Wilson's Snipe	✓		✓		✓		1	1	1	✓	✓	✓	✓	1	✓	1	1	4	5	4204
Red-necked Phalarope									✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	4241
Red Phalarope																✓	-	-	-	4242
Spotted Sandpiper	1		2		1		1	✓	✓	1	2	✓	1	✓	✓	1	5	5	10	4246
Solitary Sandpiper	✓		✓	2	✓		✓	2	5	1	3	3	2	1	3	✓	-	22	22	4249
Wandering Tattler										✓							-	-	-	4253
Greater Yellowlegs			✓		✓		✓		✓		✓		✓				-	-	-	4256
Lesser Yellowlegs	✓		✓		✓		✓		✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	4263

SPECIES	2005		2006		2007		2008		2009	2010	2011	2012	2013	2014	2015	2016	SPRING TOTAL	FALL TOTAL	ALL TIME TOTAL	
	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall				Taxon Order
Parasitic Jaeger								✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	4396
Long-tailed Jaeger													✓				-	-	-	4398
Black-legged Kittiwake										✓				✓			-	-	-	4473
Sabine's Gull								✓	✓	✓	✓	✓		✓		✓	-	-	-	4479
Bonaparte's Gull	✓		✓		✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	4486
Little Gull										✓	✓						-	-	-	4505
Mew Gull	✓		✓				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	4531
California Gull										✓		✓					-	-	-	4546
Herring Gull	✓		✓		✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	4549
Thayer's Gull								✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	4566
Iceland Gull																✓	-	-	-	4569
Glaucous-winged Gull										✓	✓						-	-	-	4586
Glaucous Gull								✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	4592
Arctic Tern	✓		✓		✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	4734
Great Horned Owl								✓	✓	✓	✓			✓	✓	✓	-	-	-	6556
Northern Hawk Owl									✓	✓	✓	✓	✓	✓		✓	-	-	-	6640
Short-eared Owl			✓							✓	✓	✓					-	-	-	6893
Boreal Owl											4			40	✓	5	-	49	49	6925
Northern Saw-whet Owl														2			-	2	2	6926
Common Nighthawk								✓	✓	✓	✓		✓	✓	✓		-	-	-	7101
Pacific Swift										✓							-	-	-	7680
Rufous Hummingbird					✓											✓	-	-	-	8354
Belted Kingfisher	✓		✓	8	✓		✓	8	6	5	6	6	2	9	6	4	-	60	60	9517
Yellow-bellied Sapsucker	2		2		2		1		✓		3	1	1				7	5	12	10416
Downy Woodpecker	✓		✓					2	1	3	7			1	1	✓	4	19	19	10643
Hairy Woodpecker	2		✓		✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	2	-	2	10661
Three-toed Woodpecker	✓							✓	✓	✓	✓	✓	1	✓	✓	✓	-	1	1	10700
Black-backed Woodpecker								✓	✓	✓	✓	✓	✓	✓	✓		-	-	-	10704
Northern Flicker	1		✓		1		✓	✓	✓	1	1	✓	3	✓	✓	3	2	8	10	10814
Pileated Woodpecker	✓																-	-	-	10894
American Kestrel	✓						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	11197
Merlin					✓		✓	✓	✓	✓	2	1	✓	✓	✓	✓	1	4	4	11230
Gyrfalcon									✓	✓		✓		✓	✓		-	-	-	11275
Peregrine Falcon					✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	11276
Olive-sided Flycatcher	✓		11		✓		6		✓	✓	1	✓	✓	✓	2	✓	17	3	20	15401
Western Wood-pewee	3		2		2		✓	3	6	5	10	3	4	4	4	✓	7	39	46	15414
Yellow-bellied Flycatcher	2	2	1		1			9	8	11	7	9	11	3	11	16	4	87	91	15460
Alder Flycatcher	17	9	41	18	10	5	9	811	631	620	637	827	770	506	1058	498	77	6390	6467	15462

SPECIES	2005		2006		2007		2008		2009	2010	2011	2012	2013	2014	2015	2016	SPRING TOTAL	FALL TOTAL	ALL TIME TOTAL	
	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall				Taxon Order
Least Flycatcher	3		4		3		2	2	1	3	10	3	6	2	4	7	12	38	50	15474
Hammond's Flycatcher	7		5		11		18	6	12	17	28	7	12	8	21	19	41	130	171	15475
Dusky Flycatcher	2				2			1	6	3	6	3	3	4	2		4	28	32	15477
Western Flycatcher												1				1	-	2	2	15486
Eastern Phoebe			1														1	-	1	15517
Say's Phoebe			2		2		1	1	1	1	✓	✓	✓	✓	2	2	5	7	12	15519
Northern Shrike	✓								✓	1	1	1	1	1	✓	1	-	6	6	18662
Warbling Vireo	13		1	4	✓		1	9	10	19	17	15	48	12	10	24	15	168	183	18955
Gray Jay	5		✓		1		✓		5	4	✓	✓	✓	1	1	✓	6	11	17	19818
Steller's Jay											✓						-	-	-	19909
Black-billed Magpie					✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	20113
Common Raven	✓		✓		✓		✓	✓	1	1	✓	✓	✓	✓	1	✓	-	3	3	20256
Horned Lark			3		✓		✓		✓	✓							3	-	3	20822
Northern Rough-winged Swallow																✓				21089
Tree Swallow	5		✓		✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	5	-	5	21126
Violet-green Swallow	✓		✓		✓		✓	✓		✓	✓	✓			✓	✓	-	-	-	21136
Bank Swallow	✓		✓				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	21157
Barn Swallow	✓		✓		✓			✓	1	✓	✓	✓	✓	✓		✓	-	1	1	21203
Cliff Swallow	✓		✓		✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	21294
Black-capped Chickadee	✓	4	4	3	2		2	57	26	22	92	65	31	16	31	24	8	371	379	21514
Mountain Chickadee							2	15	11		2	1	✓		4		2	33	35	21526
Chestnut-backed Chickadee								1			✓						-	1	1	21542
Boreal Chickadee	2		3		2		8	138	831	✓	233	142	23	3	131	40	15	1541	1556	21546
Hybrid Chickadee			1					1									1	1	2	21552
Red-breasted Nuthatch	✓				✓		1	3	2	2	5	12	6	3	9	3	1	45	46	21849
Brown Creeper											✓						-	-	-	21939
Winter Wren	1										✓			1			1	1	2	22131
American Dipper														✓			-	-	-	22583
Golden-crowned Kinglet		1					✓		10	2	1	3	1		2	3	-	23	23	23061
Ruby-crowned Kinglet	25	7	51	3	27		72	29	175	109	86	134	125	69	284	89	175	1110	1285	23068
Mountain Bluebird	✓				✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	27338
Townsend's Solitaire								✓	1	✓	1	1	✓	✓	✓	2	-	5	5	27342
Gray-cheeked Thrush	4	2	2		5		1	1	2	8	2	4	2	10	11	8	12	50	62	27436
Swainson's Thrush	99	7	39	10	48		21	19	49	53	85	41	55	49	68	82	207	518	725	27442
Hermit Thrush	1		1		✓		1	1	7	12	12	3	2	1	8	7	3	53	56	27451
American Robin	27	1	36	5	17		4	✓	27	9	11	✓	4	9	3	✓	84	69	153	27765
Varied Thrush	✓		1		2		✓	3	12	5	2	2	5	3	2	✓	3	34	37	27795
European Starling							✓										-	-	-	28048

SPECIES	2005		2006		2007		2008		2009	2010	2011	2012	2013	2014	2015	2016	SPRING TOTAL	FALL TOTAL	ALL TIME TOTAL	
	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall				Taxon Order
American Pipit	✓		2		✓		1	1	3	✓	2	✓	2	✓	6	2	3	16	19	29190
Bohemian Waxwing	✓		40		✓		23	✓	✓	✓	1	✓	✓	✓	✓	✓	63	1	64	29257
Cedar Waxwing									✓	2			8	✓			-	10	10	29261
Lapland Longspur	✓		✓		✓		5	✓	✓	✓	✓	✓	✓	✓	✓	✓	5	-	5	29292
Smith's Longspur									✓				✓				-	-	-	29297
Snow Bunting										✓	✓	✓	✓	✓			-	-	-	29300
Northern Waterthrush	4	1	14	10	11		4	46	53	54	42	47	46	48	53	34	33	434	467	29314
Black-and-white Warbler															1			1	1	29323
Tennessee Warbler	4		4		6		2		9	40	4	1	1	1	8	13	16	77	93	29333
Orange-crowned Warbler	16	6	26	1	47		61	101	180	271	57	88	124	149	331	364	150	1672	1822	29334
Nashville Warbler								1				1					-	2	2	29342
MacGillivary's Warbler	1		1					1	3	2		1	1				2	8	10	29365
Common Yellowthroat	1		17	4	11	6	21	66	113	70	72	45	65	82	89	57	50	669	719	29385
American Redstart			6	4	1			10	43	30	39	21	33	25	47	15	7	267	274	29414
Cape May Warbler							1					1					1	1	2	29416
Magnolia Warbler	1							1			✓	1	1				1	3	4	29438
Blackburnian Warbler															1			1	1	29441
Yellow Warbler	10	6	50	19	37	3	31	486	325	471	310	225	333	504	556	449	128	3687	3815	29443
Blackpoll Warbler	3	2	21	4	10		5	47	107	194	58	87	87	61	99	134	39	880	919	29486
Yellow-rumped Warbler							1	1									1	1	2	29500
Yellow-rumped Warbler (Myrtle)	60	3	63	5	29		78	49	284	673	142	195	163	178	311	286	230	2289	2519	29501
Yellow-rumped Warbler (Audubon's)										✓	1						-	1	1	29502
Townsend's Warbler			✓				1	✓	8	10	6	6	7	10	2	2	1	51	52	29536
Wilson's Warbler	116	8	54	5	63		151	113	161	177	133	134	122	164	386	172	384	1575	1959	29667
American-tree Sparrow	220		13	1	72		41	19	54	21	77	17	19	22	137	20	346	387	733	31100
Chipping Sparrow	28		4	1	6		3	6	24	18	28	17	20	15	29	31	41	189	230	31103
Brewer's Sparrow				1					1		2						-	4	4	31120
Fox Sparrow	106		3		17		26	11	28	28	17	6	7	17	42	10	152	166	318	31208
Dark-eyed Junco					9		31	11	✓	✓	✓	✓			2		40	13	53	31232
Dark-eyed Junco (Slate-colored)	165	12	139	5	135		224	182	582	420	331	116	341	140	209	229	663	2569	3232	31234
White-crowned Sparrow	86	3	13		579		311	1	33	36	34	22	16	15	23	15	989	198	1187	31294
Golden-crowned Sparrow	1				16		9						1	1	2		26	4	30	31302
White-throated Sparrow			✓		1												1	-	1	31306
Savannah Sparrow	11	2	2	2	24		10	14	18	18	23	25	18	17	55	17	47	209	256	31326
Song Sparrow										1						1	-	2	2	31352
Lincoln's Sparrow	9	1	6		39		21	5	16	15	27	9	9	9	65	13	75	169	244	31385
Swamp Sparrow										1							-	1	1	31389
Western Tanager			1						1		✓	✓					1	1	2	31767

SPECIES	2005		2006		2007		2008		2009	2010	2011	2012	2013	2014	2015	2016	SPRING TOTAL	FALL TOTAL	ALL TIME TOTAL	
	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall				Taxon Order
Red-winged Blackbird	✓		1		1		✓		✓		✓	✓	✓			✓	2	-	2	31953
Rusty Blackbird	19		3		2	1	✓	11	30	20	16	9	14	10	18	6	24	135	159	32034
Brown-headed Cowbird	1		✓		✓		✓			✓	1		✓	2	1		1	4	5	32143
Pine Grosbeak			2					✓	✓	✓	✓	✓	✓	✓	✓	✓	2	-	2	32477
Purple Finch	27		3		6		1	✓	✓	10	1	2	1	3	✓	✓	37	17	54	32576
Red Crossbill	3						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	3	-	3	32678
White-winged Crossbill			5					2	2	100	1	2	5	2	✓	46	5	160	165	32718
Common Redpoll	✓		107		1		22	✓	6	1	75	47	✓	1	8	3	130	141	271	32722
Hoary Redpoll					3						2			✓			3	2	5	32729
Pine Siskin	28		1				✓	1	1	91	10	3	8	303	1	3	29	421	450	32736
Evening Grosbeak														✓			-	-	-	32968
TOTAL SPECIES BANDED	**43**	**18**	**48**	**21**	**43**	**4**	**45**	**48**	**53**	**52**	**57**	**51**	**51**	**48**	**51**		**70**	**78**	**89**	
TOTAL BIRDS BANDED	**1142**	**77**	**814**	**115**	**1267**	**15**	**1238**	**2319**	**3956**	**3706**	**2793**	**2429**	**2,577**	**2,510**	**4,186**		**4461**	**24728**	**29189**	

Appendix B – Daily Species Total Summary

Species	First Date	ALL OBS		Last Date	HIGH COUNT	
		# of Days	Bird Days		#	Date
Greater White-fronted Goose	17-Aug	10	2267	10-Sep	1647	01-Sep
Snow Goose	28-Sep	5	453	14-Oct	294	26-Sep
Snow Goose (Blue Form)	26-Sep	1	1	-	1	26-Sep
Canada Goose	31-Jul	21	373	06-Oct	63	10-Sep
Unidentified Goose	27-Aug	8	898	29-Sep	420	02-Sep
Trumpeter Swan	28-Sep	14	337	15-Oct	56	12-Oct
Tundra Swan	26-Sep	14	9324	15-Oct	3832	06-Oct
Unidentified Swan	18-Sep	13	647	15-Oct	279	06-Oct
American Wigeon	27-Aug	3	20	06-Oct	13	25-Sep
Mallard	26-Jul	15	153	06-Oct	90	06-Oct
Northern Shoveler	27-Aug	3	8	06-Oct	4	27-Aug
Northern Pintail	27-Jul	9	59	06-Oct	24	10-Sep
Green-winged Teal	5-Aug	5	27	06-Oct	9	05-Aug
Canvasback	26-Sep	3	43	08-Oct	32	27-Sep
Ring-necked Duck	5-Aug	4	8	26-Sep	3	20-Sep
Greater Scaup	28-Aug	10	86	14-Oct	29	26-Sep
Lesser Scaup	19-Aug	19	471	06-Oct	150	26-Sep
Unidentified Scaup	8-Sep	5	79	09-Oct	58	11-Sep
Harlequin Duck	29-Aug	2	5	08-Sep	4	08-Sep
Surf Scoter	27-Jul	22	328	15-Oct	80	09-Sep
White-winged Scoter	2-Aug	13	79	12-Oct	18	15-Sep
Unidentified Scoter	28-Jul	1	1	-	1	28-Jul
Long-tailed Duck	4-Sep	3	7	14-Oct	5	14-Oct
Bufflehead	27-Sep	3	18	05-Oct	16	03-Oct
Common Goldeneye	23-Sep	11	53	15-Oct	11	11/12 Oct
Barrow's Goldeneye	8-Sep	7	16	09-Oct	4	many days
Unidentified Goldeneye	13-Sep	8	24	11-Oct	4	18/21 Sep
Hooded Merganser	5-Oct	1	1	-	1	05-Oct
Common Merganser	25-Jul	35	350	15-Oct	65	03-Sep
Red-breasted Merganser	25-Jul	41	177	11-Oct	12	08-Sep
Unidentified Duck	17-Aug	6	107	12-Oct	43	17-Aug
Ruffed Grouse	29-Jul	43	68	11-Oct	5	08-Sep
Spruce Grouse	22-Sep	1	1	-	1	22-Sep
Red-throated Loon	31-Jul	42	131	15-Oct	12	17-Sep
Pacific Loon	30-Jul	40	264	26-Sep	133	26-Sep
Common Loon	25-Jul	62	328	14-Oct	18	17-Sep
Yellow-billed Loon	26-Sep	1	1	-	1	26-Sep
Unidentified Loon	2-Sep	11	49	05-Oct	13	26-Sep
Horned Grebe	28-Jul	37	84	15-Oct	6	28-Sep

Species	First Date	ALL OBS		Last Date	HIGH COUNT	
		# of Days	Bird Days		#	Date
Red-necked Grebe	25-Jul	69	1024	15-Oct	56	11-Aug
Great Blue Heron	12-Aug	1	1	-	1	12-Aug
Osprey	2-Sep	18	48	04-Oct	13	10-Sep
Golden Eagle	7-Sep	20	96	15-Oct	19	05-Oct
Northern Harrier	26-Jul	47	236	14-Oct	54	10-Sep
Sharp-shinned Hawk	27-Jul	55	589	12-Oct	141	10-Sep
Northern Goshawk	4-Aug	24	39	14-Oct	3	03-Sep
Bald Eagle	29-Jul	44	102	15-Oct	15	10-Sep
Unidentified Eagle	23-Sep	1	1	-	1	23-Sep
Swainson's Hawk	31-Aug	3	3	02-Sep	1	all days
Red-tailed Hawk	27-Aug	7	10	04-Oct	4	27-Aug
Red-tailed Hawk (Harlan's)	4-Aug	38	717	13-Oct	368	10-Sep
Rough-legged Hawk	10-Sep	14	57	14-Oct	18	03-Oct
Unidentified Buteo	3-Sep	4	5	28-Sep	2	28-Sep
Sandhill Crane	31-Aug	8	765	29-Sep	429	10-Sep
American Golden-Plover	3-Aug	1	1	-	1	03-Aug
Semipalmated Plover	26-Jul	15	40	22-Aug	9	06-Aug
Killdeer	27-Aug	2	3	30-Aug	2	30-Aug
Sharp-tailed Sandpiper	8-Sep	1	1	-	1	08-Sep
Sanderling	4-Sep	1	1	-	1	04-Sep
Least Sandpiper	29-Jul	11	33	15-Aug	7	05-Aug
Pectoral Sandpiper	29-Aug	2	2	02-Sep	1	both days
Semipalmated Sandpiper	10-Aug	2	2	15-Aug	1	both days
Western Sandpiper	12-Aug	1	1	-	1	12-Aug
Unidentified Peep	29-Jul	3	15	02-Aug	6	31 Jul/2 Aug
Long-billed Dowitcher	4-Sep	1	1	-	1	04-Sep
Wilson's Snipe	30-Aug	3	3	04-Sep	1	all days
Red-necked Phalarope	24-Sep	4	6	02-Oct	3	07-Aug
Unidentified Phalarope	5-Sep	1	1	-	1	05-Sep
Spotted Sandpiper	25-Jul	38	98	18-Sep	7	03-Aug
Solitary Sandpiper	29-Jul	7	8	23-Aug	2	06-Aug
Lesser Yellowlegs	28-Jul	2	4	29-Jul	3	29-Jul
Unidentified Shorebird	28-Jul	5	12	11-Sep	4	06-Sep
Parasitic Jaeger	16-Sep	2	2	17-Sep	1	both days
Unidentified Jaeger	13-Sep	1	1	-	1	13-Sep
Sabine's Gull	24-Sep	3	5	06-Oct	2	24 Sep/ 6 Oct
Bonaparte's Gull	5-Aug	3	8	13-Aug	4	13-Aug
Mew Gull	25-Jul	35	150	26-Sep	38	30-Jul
Herring Gull	25-Jul	80	2949	15-Oct	165	31-Jul

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Thayer's Gull	19-Aug	30	122	15-Oct	25	26-Sep
Iceland Gull	26-Sep	1	1	-	1	26-Sep
Glaucous Gull	15-Sep	1	1	-	1	15-Sep
Arctic Tern	25-Jul	13	128	16-Aug	58	28-Jul
Great Horned Owl	11-Sep	1	1	-	1	11-Sep
Northern Hawk Owl	13-Sep	1	1	-	1	13-Sep
Rufous Hummingbird	27-Jul	2	2	29-Jul	1	both days
Belted Kingfisher	25-Jul	29	41	05-Oct	4	28-Jul
Downy Woodpecker	30-Jul	10	10	17-Sep	1	all days
Hairy Woodpecker	5-Sep	7	7	04-Oct	1	all days
American Three-toed Woodpecker	3-Sep	1	1	-	1	03-Sep
Unidentified Woodpecker	4-Sep	1	1	-	1	04-Sep
Northern Flicker	25-Jul	15	17	07-Sep	3	31-Jul
American Kestrel	21-Aug	25	125	03-Oct	38	10-Sep
Merlin	26-Jul	34	72	15-Oct	10	03-Oct
Peregrine Falcon	27-Aug	9	20	28-Sep	10	10-Sep
Unidentified Raptor	29-Sep	1	1	-	1	29-Sep
Olive-sided Flycatcher	6-Aug	2	2	10-Aug	1	both days
Western Wood-Pewee	18-Aug	5	6	09-Sep	2	18-Aug
Yellow-bellied Flycatcher	27-Jul	14	16	04-Sep	2	8 Aug/4 Sep
Alder Flycatcher	30-Jul	45	526	20-Sep	75	21-Aug
Least Flycatcher	29-Jul	6	7	28-Aug	2	02-Aug
Hammond's Flycatcher	25-Jul	14	24	14-Sep	4	24/26 Jul
Pacific-slope Flycatcher	4-Aug	1	1	-	1	04-Aug
Say's Phoebe	3-Aug	3	4	06-Sep	2	03-Aug
Unidentified Flycatcher	1-Aug	1	1	-	1	01-Aug
Northern Shrike	26-Sep	1	1	-	1	26-Sep
Warbling Vireo	25-Jul	23	43	11-Sep	4	13-Aug
Gray Jay	18-Aug	11	26	15-Oct	4	many days
Black-billed Magpie	5-Sep	32	35	15-Oct	2	many days
Common Raven	25-Jul	80	339	15-Oct	15	05-Oct
Northern Rough-winged Swallow	4-Aug	1	1	-	1	04-Aug
Tree Swallow	25-Jul	3	5	31-Jul	3	31-Jul
Violet-green Swallow	25-Jul	6	19	31-Jul	9	27-Jul
Bank Swallow	25-Jul	9	64	06-Sep	16	26-Jul
Barn Swallow	30-Jul	4	10	15-Aug	3	12/15 Aug
Cliff Swallow	25-Jul	4	6	05-Aug	3	05-Aug
Unidentified Swallow	25-Jul	12	226	10-Sep	57	29-Jul
Black-capped Chickadee	25-Jul	66	162	15-Oct	4	many days

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Boreal Chickadee	31-Jul	28	62	30-Sep	6	04-Sep
Red-breasted Nuthatch	27-Jul	8	11	17-Aug	3	05-Aug
Golden-crowned Kinglet	25-Jul	4	7	18-Sep	3	04-Sep
Ruby-crowned Kinglet	27-Jul	51	126	14-Oct	10	27-Sep
Mountain Bluebird	29-Aug	1	3	-	3	29-Aug
Townsend's Solitaire	19-Aug	9	13	18-Sep	2	many days
Gray-cheeked Thrush	1-Sep	6	9	20-Sep	3	04-Sep
Swainson's Thrush	27-Jul	39	113	04-Oct	16	02-Sep
Hermit Thrush	8-Sep	6	8	27-Sep	3	27-Sep
American Robin	25-Jul	50	2592	15-Oct	438	17-Sep
Varied Thrush	19-Aug	31	697	08-Oct	279	06-Sep
Unidentified Large Thrush	3-Sep	20	427	05-Oct	87	11-Sep
American Pipit	15-Aug	43	383	14-Oct	61	01-Sep
Bohemian Waxwing	26-Jul	28	914	15-Oct	110	14-Oct
Lapland Longspur	3-Sep	18	35	06-Oct	5	8/17 Sep
Northern Waterthrush	25-Jul	33	58	08-Sep	4	30-Aug
Tennessee Warbler	28-Jul	12	17	02-Sep	3	3/7 Aug
Orange-crowned Warbler	25-Jul	48	425	04-Oct	68	01-Sep
Common Yellowthroat	29-Jul	34	71	19-Sep	5	24-Aug
American Redstart	25-Jul	21	33	05-Sep	4	25/26 Jul
Yellow Warbler	25-Jul	50	605	15-Sep	110	01-Sep
Blackpoll Warbler	25-Jul	48	203	18-Sep	11	21-Aug
Yellow-rumped Warbler (Myrtle)	25-Jul	17	1482	12-Oct	241	03-Sep
Townsend's Warbler	2-Aug	4	4	12-Aug	1	all days
Wilson's Warbler	25-Jul	47	201	05-Oct	42	30-Aug
Unidentified Warbler	4-Aug	22	196	11-Sep	33	03-Sep
American Tree Sparrow	24-Aug	19	32	08-Oct	5	05-Sep
Chipping Sparrow	25-Jul	18	58	21-Aug	9	31-Jul
Fox Sparrow	25-Aug	9	11	23-Sep	3	17-Sep
Dark-eyed Junco (Slate-colored)	25-Jul	51	357	08-Oct	33	05-Sep
White-crowned Sparrow	27-Jul	10	18	17-Sep	4	17-Aug
Savannah Sparrow	5-Aug	24	39	04-Oct	4	20-Aug
Song Sparrow	18-Aug	1	1	-	1	18-Aug
Lincoln's Sparrow	1-Aug	11	13	23-Sep	3	21-Aug
Unidentified Sparrow	6-Sep	1	1	-	1	06-Sep
Red-winged Blackbird	29-Jul	1	1	-	1	29-Jul
Rusty Blackbird	22-Aug	42	517	09-Oct	79	04-Sep
Unidentified Blackbird	31-Jul	1	1	-	1	31-Jul
Pine Grosbeak	4-Oct	8	63	15-Oct	22	15-Oct

Species	First Date	ALL OBS		Last Date	HIGH COUNT	
		# of Days	Bird Days		#	Date
Purple Finch	25-Jul	5	6	06-Aug	2	01-Aug
Red Crossbill	4-Oct	2	4	09-Oct	3	04-Oct
White-winged Crossbill	25-Jul	68	2698	15-Oct	391	24-Sep
Unidentified Crossbill	26-Jul	31	1522	25-Oct	324	24-Sep
Common Redpoll	1-Aug	17	1711	15-Oct	707	14-Oct
Pine Siskin	25-Jul	36	189	03-Oct	44	25-Sep
Unidentified Small Finch	5-Sep	29	1419	15-Oct	136	24-Sep
Unidentified Passerine	26-Jul	63	7282	15-Oct	1101	06-Sep